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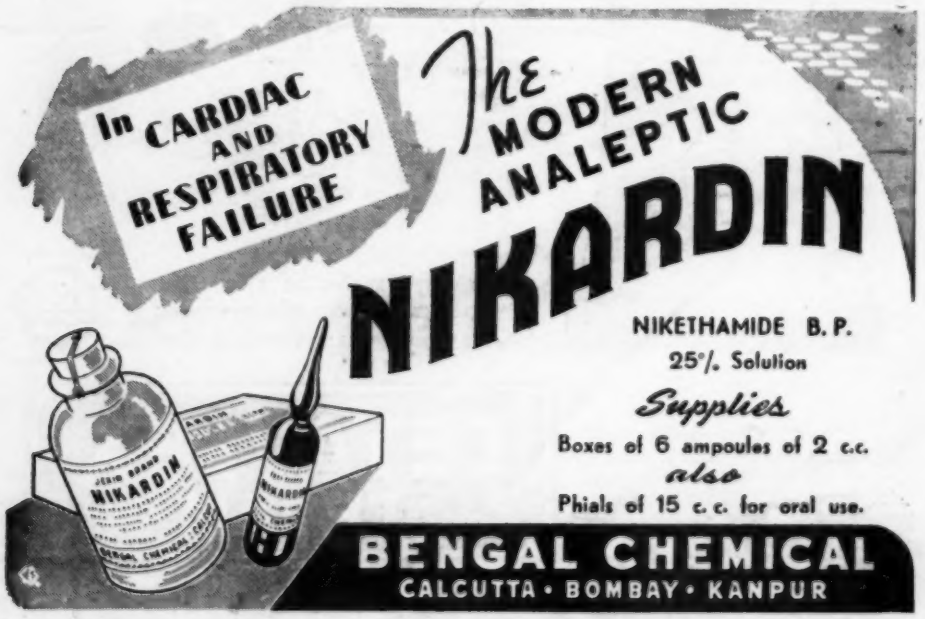

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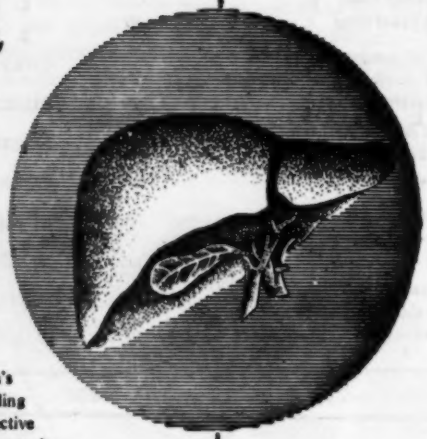

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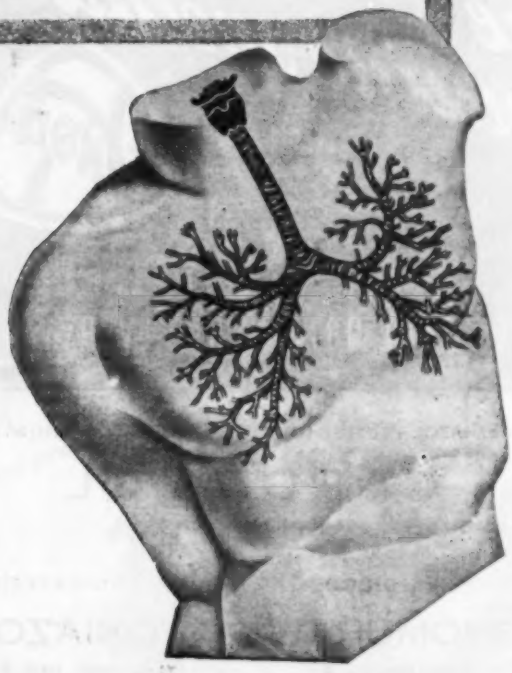

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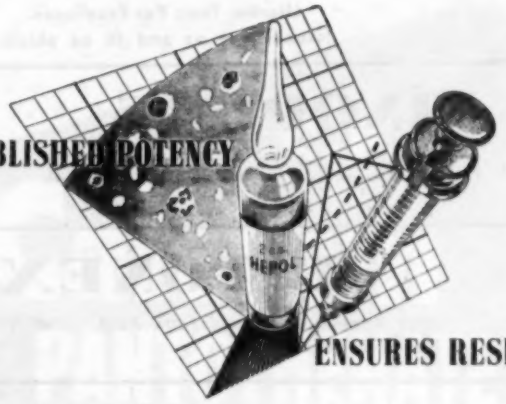

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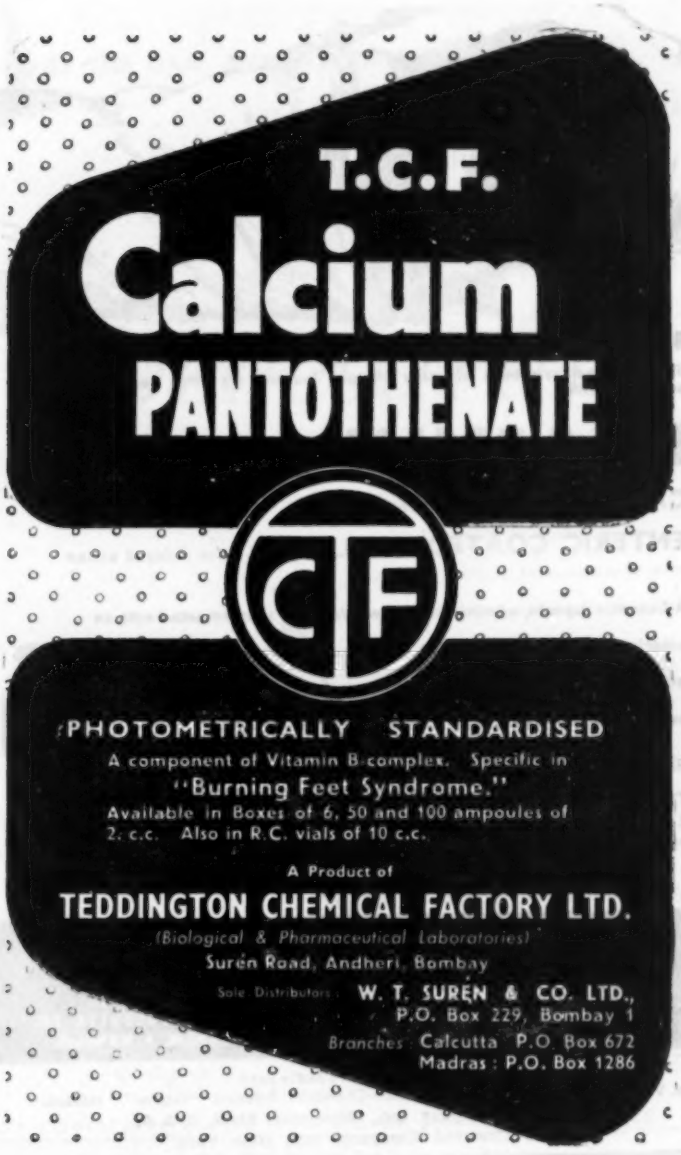
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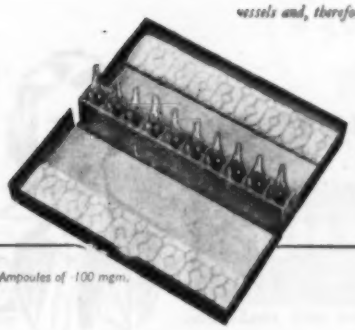

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ORIGINAL ARTICLES

OBSERVATIONS ON THE COMPLEMENT FIXATION TEST FOR KALA-AZAR

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The complement fixation test for kala-azar using an antigen prepared from Kedrowsky's acid-fast bacillus has now been in routine use at the School of Tropical Medicine, Calcutta, for about ten years. The preliminary investigations on complement fixation in kala-azar using the original 'tuberculose antigen' of Witebsky, Klingenstein and Kuhn prepared from the human tubercle bacillus had been carried out in 1938-39 with very encouraging results and it was felt that with this antigen a satisfactory complement fixation test for kala-azar had been evolved (Greval, Sen Gupta and Napier, 1939; Sen Gupta, 1943). The antigen prepared from Kedrowsky's acid-fast bacillus was adopted in 1943 in view of the observation that antigens prepared from various acid-fast bacilli, viz., *M. phlei*, and the so-called leprosy bacilli of Bayon, Duval, Kedrowsky, or Lleras, yielded similar complement fixation reaction as the original antigen prepared from human tubercle bacillus (Dharmendra and Bose, 1941) and that Kedrowsky's bacillus could be easily grown in large quantities in the laboratory. Using this antigen, it was found that positive reactions could be obtained in 93 per cent of the cases of kala-azar and negative reactions in almost all conditions likely to be considered in the diagnosis of kala-azar with the exception of about 10 per cent of the cases of chronic pulmonary tuberculosis in which also positive complement fixation reaction was obtained (Sen Gupta, 1944). Full details of the method of preparation of the antigen were published in a subsequent paper (Dharmendra, Bose and Sen Gupta, 1946) and a modified technique of the test was described (Sen Gupta, 1945) and this method has been adopted for routine use since 1945. The present paper is based on our experience of this test during the recent years and the subjects considered are: incidence of positive complement fixation reaction in kala-azar; conditions other than kala-azar giving a positive reaction; effect of specific treatment of kala-azar on the complement fixation reaction; anti-complementary nature of the serum in kala-azar; and then discuss the results obtained with this test.

THE INCIDENCE OF POSITIVE COMPLEMENT FIXATION REACTION IN KALA-AZAR

The results obtained in three groups of cases are considered below: (*a*) the aldehyde-positive cases of kala-azar, *i.e.*, in which the diagnosis was confirmed by Napier's aldehyde test; (b) the parasite-positive cases, in which Leishman-Donovan bodies were demonstrated in the spleen, bone-marrow, liver or peripheral blood smear; and (*c*) cases of Sudan kala-azar diagnosed by Dr. R. Kirk.

(*a*) *Complement fixation reaction in the aldehyde-positive cases of kala-azar*—During the five year period 1946-50, the complement fixation test was carried out in a series of 2,033 cases of kala-azar showing positive reaction with Napier's aldehyde test (+++, ++ or +). In 325 cases the sera proved to be highly anti-complementary and the complement fixation reaction could not be assessed in the routine test. In the remaining 1,708 cases complement fixation reactions were obtained and Table 1 shows the results along with the results of the aldehyde test. The complement fixation reactions are recorded as 'strongly positive', 'positive', 'doubtful' and 'negative' in accordance with the criteria described in the paper dealing with the technique of the test (Sen Gupta, 1945). It will be found from the table that 'positive' complement fixation reaction was obtained in 1,618 (strongly positive in 1,255 and positive in 363 cases) out of 1,708 cases of kala-azar (94·7 per cent); 'doubtful' reaction in 65 (3·8 per cent) and negative reaction in 25 (1·4 per cent).

TABLE 1—SHOWING COMPLEMENT FIXATION REACTION IN ALDEHYDE-POSITIVE CASES OF KALA-AZAR

Aldehyde Test / Complement fixation test	+++	++	+	Total	% of total
Strongly positive	549 (73·3%)	279 (69·9%)	427 (76·2%)	1255	(94·7%)
Positive	169 (22·5%)	99 (24·8%)	95 (16·9%)	363	
Doubtful	27	17	21	65	(3·8%)
Negative	4	4	17	25	(1·4%)
Total	749	399	560	1708	
Anti-complementary sera	219 (22·6%)	62 (13·4%)	44 (7·2%)	325 (of grand total)	(15·9%
Total of each group	968	461	604	2033	(grand total)

(*b*) ***Complement fixation reaction in 'parasite-positive' cases of kala-azar***—During the period extending from July, 1945 to the end of 1951, of the patients admitted into the Hospital for Tropical Diseases, the complement fixation test for kala-azar was done in 358 cases in which *Leishmania donovani* was demonstrated in spleen, sternum, ilium, tibia or liver puncture or peripheral blood smear. Table 2 shows the results obtained in this series of cases; complement fixation and aldehyde reactions have been included in all but 44 cases in which the latter test was not done. Aldehyde-negative cases and most of the cases in which the aldehyde test was not done were early cases of kala-azar, some as early as the beginning of the third week of acute enteric like onset of the disease. Strongly positive or positive complement fixation reaction was obtained in 298 out of a total of 315 cases in which the serum was not too anti-complementary for the test (94·6 per cent). The incidence of positive reaction was almost identifical in the three groups of cases, viz., 'aldehyde-positive' well-developed cases, 'aldehyde-doubtful' or mostly moderately advanced cases and 'aldehyde-negative' early cases of kala-azar.

(*c*) ***Complement fixation reaction in Sudan kala-azar***—Sera from twenty-three cases of kala-azar from Sudan were received through the courtesy of Dr. R. Kirk of Khartoum. Strongly positive or positive reaction was obtained in 21 cases (91·4 per cent) and negative in the remaining two cases. The difference in the inci-

TABLE 2—SHOWING COMPLEMENT FIXATION IN 'PARASITE-POSITIVE' CASES OF KALA-AZAR

Aldehyde test / Complement fixation test	Positive +++, ++ or +		Doubtful (+) or (±)		Negative (−) or-ve		AT not done		Total	% of total
Strongly positive	113	(94%)	41	(93·2%)	25	(93·2%)	29	(97·7%)	208	(94·6%)
Positive	45		14		17		14		90	
Doubtful	7		4		3		1		15	
Negative	2		0		0		0		2	
Total	167		59		45		44		315	
Anti-complementary sera	42		0		1		0		43 (12% of grand total)	
Total of each group	209		59		46		44		358 (grand total)	

dence of positive reaction noted in this series of cases is more apparent than real in view of the smallness of the number of sera in this group.

On consideration of the results obtained in the above three groups of cases, it will be apparent that in 1,937 out of a total of 2,046 cases in the three groups, i.e., about 95 per cent of the cases of kala-azar in all stages of the disease from the third week onwards, positive reaction is obtained with this complement fixation test. The proportion of cases showing positive complement fixation reaction is practically the same in the early, moderately advanced and chronic cases of kala-azar.

CONDITIONS OTHER THAN KALA-AZAR GIVING POSITIVE COMPLEMENT FIXATION REACTION

It was shown in a previous publication (Sen Gupta, 1944), that the complement fixation test for kala-azar using the antigen prepared from Kedrowsky's acid-fast bacillus was negative in all conditions, febrile or afebrile that have to be considered in the differential diagnosis of kala-azar with the exception of about 10 per cent of cases of clinically obvious chronic pulmonary tuberculosis. Lepromatous leprosy and post-kala-azar dermal leishmaniasis in which the test may show positive reaction are not considered in the differential diagnosis of kala-azar. Our recent experience of the test has

generally confirmed this finding; but positive complement fixation reactions have been obtained in a few cases of abdominal tuberculosis, in about 5 per cent of the cases of eosinophilic lung (1 in 20 cases), and in a case of actinomycosis affecting the neck, the shoulder region, and the lungs and also showing splenic enlargement.

Effect of Specific Treatment of Kala-azar on the Complement Fixation Test

It was previously reported that specific treatment of kala-azar causes the complement fixation reaction to become negative or produces a definite lowering of the degree of complement fixation. In Table 3 we present the results of complement fixation test before and 2 to 3 weeks after the completion of a course of specific treatment* in a series of 48 cases of kala-azar during 1951. Whether the patients could be regarded as clinically cured (C) or whether further treatment was deemed necessary (F) is also indicated in the table along with the complement fixation reactions after treatment, in order to estimate whether changes in the reaction were in any way related to clinical cure of the disease.

Table 3—Showing Changes in Complement Fixation Reaction 2 to 3 Weeks after Completion of a Course of Injections for Kala-azar and the Results of Treatment

Before \ *After*		*Strongly positive*	*Positive*	*Doubtful*	*Negative*	*Total*
Strongly positive 28 cases	C	0	6	8	10	24
	F	1	3	0	0	0
Positive 15 cases	C	1	1	2	11	15
	F	0	0	0	0	0
Doubtful 4 cases	C	0	0	0	3	3
	F	1	0	0	0	1
Anti-complementary serum 1 case	C	0	0	0	1	1
	F	0	0	0	0	0

C = Clinically cured; F = Not completely cured, further treatment advised.

On perusal of Table 3, it appears that of the 43 cases that could be discharged as clinically cured, 35 showed 'doubtful' or negative reaction and 8 positive reaction; all the 5 cases that did not appear to be cured and were advised further treatment showed positive complement fixation reaction after the end of the course of treatment. In 6 out of 8 cases showing positive reaction and discharged as clinically cured, there had been a fall in the degree of complement fixation.

* Usually 15 bi-weekly injections of urea stibamine or aminostiburea.

Though it may be concluded that clinical cure of kala-azar is generally associated with disappearance or decrease of titre of complement fixation and that failure of a course of treament is generally associated with persistence of positive reaction, this is not invariably the case.

Anti-Complementary Nature of the Serum in Kala-azar

That the serum of kala-azar patients may contain anti-complementary substances has been known for many years, and Brahmachari (1928) described an 'anti-complementary globulin test' for kala-azar that was dependent on this property of kala-azar serum.

In the present technique of complement fixation test for kala-azar, a serum is labelled as anti-complementary to the extent of interfering with the reaction, when 0·01 c.c. of the serum *alone* neutralises about 2 minimum hæmolytic dose (MHD) or more of the complement. Tables 1 and 2 show that the proportion of kala-azar sera proving anti-complementary is quite considerable—between 12 and 16 per cent, and that the anti-complementary sera are almost entirely restricted to those showing positive aldehyde reaction and the sera with + + + reaction show a higher proportion of anti-complementary sera than those with + + reaction, and the latter group than those showing + aldehyde reaction. It appears that increasingly larger proportion of kala-azar sera becomes anti-complementary with chronicity of the disease.

Discussion

The complement fixation test for kala-azar using the antigen extracted from Kedrowsky's acid-fast bacillus, belongs to the 'non-specific' type of complement fixation reactions. This fact is sometimes regarded as a drawback inspite of the great value of the classical example of non-specific type of complement fixation reaction, viz., the Wassermann reaction. Attempts to evolve a satisfactory 'specific' type of complement fixation test for kala-azar have been made by many workers during the last 42 years with conflicting and variable results. The antigens used by these workers have been prepared from (*a*) cultures of leishmanial flagellates and (*b*) heavily parasitised organs from cases of human kala-azar or experimental leishmaniasis of animals (leishmania form of the parasite along with tissue extract). Of the older workers, Moses (1919) and Auricchio (1927) obtained relatively satisfactory results with antigen prepared from flagellate cultures and Hindle, Hou and Patton (1926) with antigen consisting of saline extract of hamster spleen. More recently Niyogi and Roy (1942) and Ghosh *et al* (1945) reported good results with antigens prepared from cultures of leishmanial flagellates; but the diagnosis of *none* of the cases of 'early kala-azar' reported by these workers was confirmed by demonstration of *Leishmania donovani* and the results obtained by these workers have not been con-

firmed by other workers. Chung and Chang (1951) using an antigen, a saline extract of the spleen and liver of leishmania infected animals or spleen of human kala-azar cases, reported positive results in 111 out of 112 cases of kala-azar and negative in all the 83 control cases. If these results can be confirmed by workers in other countries and in larger number of cases, a satisfactory 'specific' type of complement fixation test for kala-azar may be regarded as evolved (Napier 1951).

Now if we consider the results obtained with the complement fixation test using the antigen prepared from Kedrowsky's acid-fast bacillus as presented in this paper and in the previous publication on this subject (Sen Gupta, 1944), it will be apparent that this test is of great value in the diagnosis of kala-azar. It has proved to be equally or more 'specific' than the Wassermann reaction. Positive reaction is obtained in 95 per cent of the cases of kala-azar in all stages of the disease. The test has been usually found to be positive as early as the third week of acute onset of kala-azar and the diagnosis in such cases subsequently confirmed by the demonstration of the parasite, *Leishmania donovani*. As for conditions other than kala-azar giving rise to positive reaction, it may be mentioned that 'false positive' Wassermann reaction is at times obtained in various tropical conditions, viz., malaria, black-water fever, kala-azar, 'tropical eosinophilia' (eosinophilic lung), hepatitis associated with gastro-intestinal disorder, etc. (Greval, Sen Gupta and Das, 1938) besides yaws and other non-venereal spirochætal diseases. With the complement fixation test for kala-azar positive reactions are obtained in kala-azar, post-kala-azar dermal leishmaniasis (13 out of 91 cases), pulmonary tuberculosis (about 10 per cent of the cases), occasional cases of abdominal tuberculosis, lepromatous leprosy, eosinophilic lung (about 5 per cent of the cases) and rare cases of actinomycosis. Leprosy, post-kala-azar dermal leishmaniasis, actinomycosis, and eosinophilic lung are easily recognised and not considered in the differential diagnosis of kala-azar. Tuberculous disease should be recognised by clinical features and radiological examination.

In this connection the importance of tuberculosis in the diagnosis of kala-azar may be discussed. Tuberculosis may simulate kala-azar or may occur as complication of the disease. It is not very rare for cases of tuberculosis with fever and splenic enlargement—the latter a not uncommon finding in rural areas in India—not responding to quinine, being diagnosed as kala-azar on so-called 'moderately positive' or 'weakly positive' aldehyde or antimony test and treated with antimonials with serious consequences to the patients (Neogy, 1952). According to Napier (1943) the aldehyde and the antimony tests may occasionally be positive in advanced tuberculosis and severe leprosy. But recent investigations by Neogy (1952) have shown that 'doubtful' i.e. (+) and ± reactions occur in about 8 per cent of cases of tuberculosis and truly positive aldehyde reaction does not occur in tuberculosis unless complicated by kala-azar. Thus in cases showing so-called moderately or weakly positive aldehyde or antimony test (no such reaction was described by Napier, 1943) that are really doubtful results, or even in cases showing positive reactions with these tests or the complement fixation test for kala-azar, every attempt should be made to exclude tuberculosis either as the only cause of the patient's illness or as complication of kala-azar before commencing antimony therapy for kala-azar. The combination of kala-azar and tuberculosis in the same patient is not very rare and it should be realised that antimony treatment of kala-azar in such cases may lead to fatal exacerbation of the tuberculous disease (Napier, 1937). Such cases should be treated with an aromatic diamidine compound, viz., stilbamidine, hydroxystilbamidine or pentamidine, for their leishmanial infection (Sen Gupta, 1944*a*, 1949).

Specific treatment of kala-azar has been found to cause the complement fixation reaction to commonly become negative or doubtful in most cases that showed signs of clinical cure, about two to three weeks after the completion of the course of injections. The positive reaction is thus an indication of active disease and not of cure and immunity against the infection. In this respect also the test is similar to the Wassermann reaction.

Summary and Conclusions

The results of complement fixation test for kala-azar using an antigen prepared from Kedrowsky's acid-fast bacillus, in three groups of cases are presented: (*a*) 2,033 aldehyde test positive cases of kala-azar, (*b*) 358 cases of kala-azar in which *Leishmania donovani* was demonstrated in spleen, bone marrow or liver puncture or peripheral blood smear, and (*c*) 23 cases of Sudan kala-azar. A total of 368 sera proved to be too anti-complementary for the test; 367 of these anti-complementary sera showed positive aldehyde reaction. Excluding the anti-complementary sera, out of the total of 2,046 sera, 1917 i.e., 94·6 per cent, gave positive complement fixation reaction. Also, almost similar proportion of positive results was found in early, moderately advanced and chronic cases of kala-azar, and positive reaction has been obtained with this test from the third week of acute onset of kala-azar onwards.

Of the conditions other than kala-azar in which the test has been positive, lepromatous leprosy, post-kala-azar dermal leishmaniasis, actinomycosis and eosinophilic lung are not considered in the diagnosis of kala-azar and tuberculous disease (mainly pulmonary tuberculosis in 10 per cent of cases of which positive reactions may be obtained) can be differentiated by clinical features and special methods, e.g., radiography, bacteriological tests, blood changes, etc. In all other conditions the test is negative.

Specific treatment and recovery from kala-azar commonly causes the test to become negative or 'doubtful'. Positive reaction with this test thus indi-

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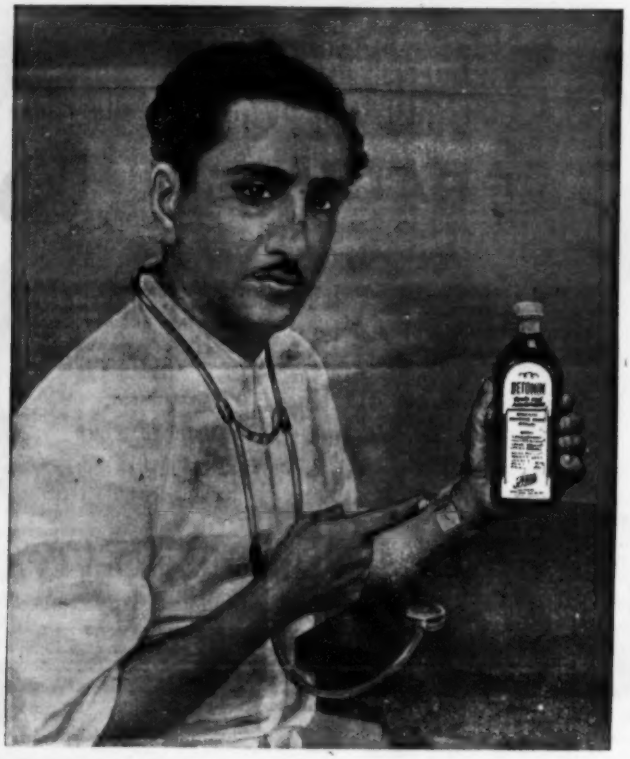

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cates active disease and not cure and immunity against the infection.

The test has thus proved to be of great value in the serum diagnosis of kala-azar and it is the test of choice for the early stages of the disease when all other serum tests are negative. Like the Wassermann reaction, the complement fixation test belongs to the 'non-specific' type of complement fixation reactions; but it has proved to be very 'specific' for kala-azar in view of the fact that the test is negative in all conditions likely to be considered in the diagnosis of kala-azar with the exception of a small proportion of cases of tuberculosis that can be distinguished clinically.

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ABSORPTION OF PAS IN HEALTH AND DISEASE

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Para-amino-salicylic acid (PAS) and its salts are now extensively used as adjuvants in the treatment of tuberculosis. Their value in tuberculosis has been reported by various authors from different countries. The consensus of opinion is that it is a tuberculostatic drug but is much less efficacious than streptomycin, and its main action seems to resist the emergence of streptomycin-resistant tubercle bacilli. In other words, PAS seems to make the tubercle bacilli sensitive to the action of streptomycin for a longer period than is expected with streptomycin alone. PAS is generally not toxic even when used over long periods—months and even years. In some cases it exhibits toxic manifestations as nausea, giddiness, diarrhœa and sometimes skin eruptions—but the toxic symptoms disappear when PAS is withdrawn. The gastro-intestinal symptoms are often controlled if PAS is administered after food, or along with vitamin B complex or if alkalies are administered half an hour before PAS.

PAS is irritant to the tissues and is therefore administered orally. Attempts are being made to inject it subcutaneously in 1-2 per cent solution; it can be given intravenously in 3-4 per cent solutions and it is used in up to 20 per cent solutions intrapleurally.

Two preparations of PAS are in use—the acid and its sodium or calcium salt. The acid is more irritant than its salts, and toxic symptoms are more common with the acid than with the salts. To minimise the irritant action of the acid on the stomach, it has been administered in enterocoated granules. Further, the acid is stated to have a toxic action on kidney tubules, and its prolonged use may cause albumen and casts to appear in the urine. The salts of PAS are said to be devoid of these toxic actions. Besides, it has been claimed by some manufacturers that the calcium salt is superior to the sodium salt in that it is more slowly absorbed and the blood PAS level is maintained over a longer period. Also calcium is believed to cause less irritation than sodium salt and less skin eruptions because of its anti-allergic properties. Incidentally, the calcium salt is more expensive than the sodium salt.

Object of Study

The object of our study was to try to find out which of the many preparations available in India were absorbed by the patients and to what extent. Our attention was specially drawn to this problem by the fact that patients began to report to the senior author that they passed some of these granules *in toto* in stool. They showed him the granules also which they had passed out. If such be the fact, it worried him whether these preparations were at all beneficial.

Method of Study

A study of absorption of PAS as administered to patients was undertaken. Four preparations were chosen—PAS sodium and PAS calcium both in cachets PAS sodium in tablet form, and free acid in enterocoated granules. Four patients were selected at random—patients who volunteered to co-operate in the study. One (C) had received no PAS, no streptomycin, no collapse therapy (Fig. 1). One (A) had taken streptomycin and PAS before but had no collapse therapy (Fig. 3). One (D) had A.P. and had no PAS and no

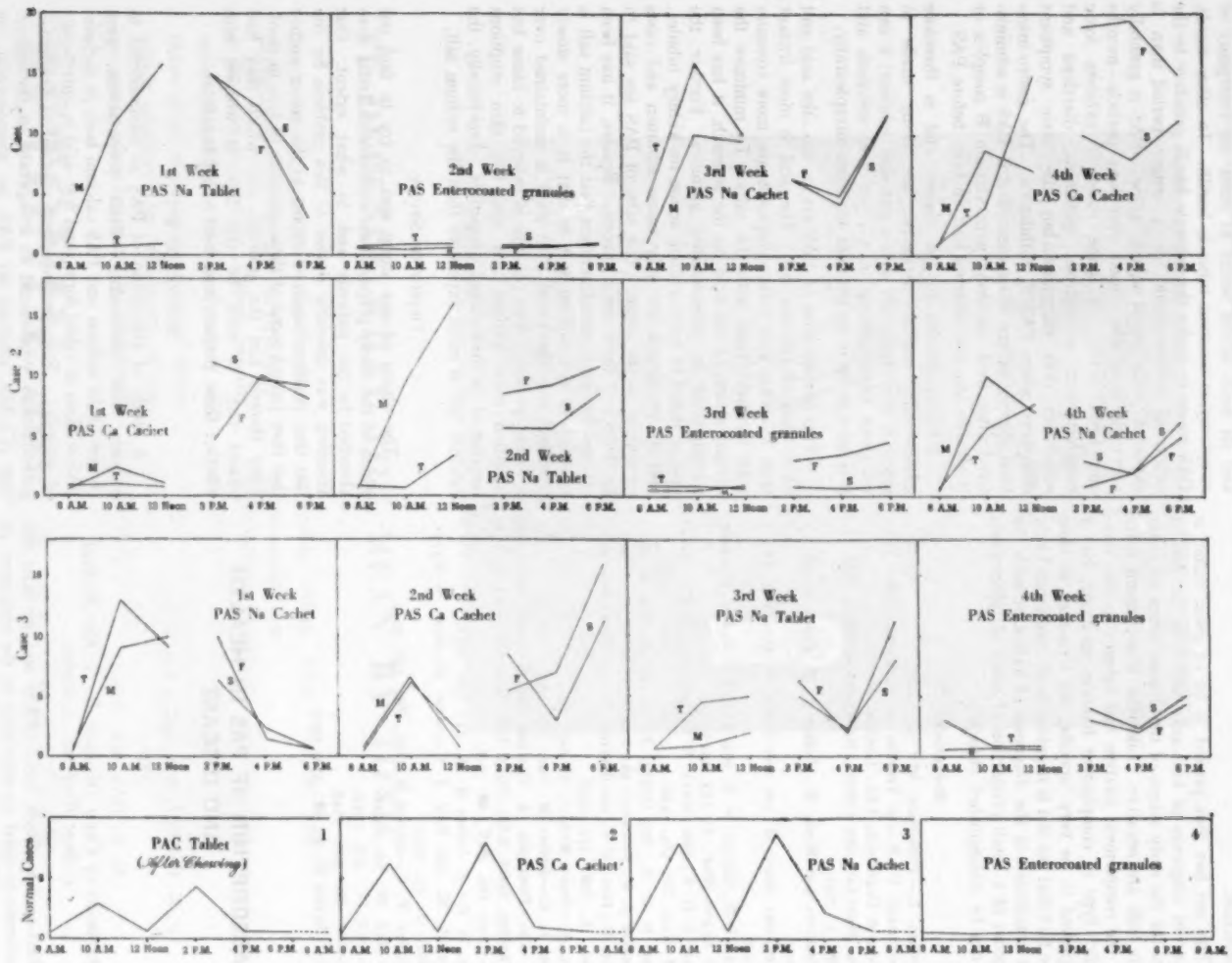

FIG. 1 FIG. 2 FIG. 3 FIG. 4

FIG. 1 (Case 1), FIG. 2 (Case 2), FIG. 3 (Case 3) AND FIG. 4 (Normal Cases)

streptomycin before (Fig. 5). The fourth (B) had P.P. and had streptomycin and PAS before (Fig. 2). Those who had PAS before, had PAS discontinued for 2 weeks prior to commencement of our study.

Four patients were chosen for the four preparations. It was decided to try the four preparations on each patient for one week only. In each week there was omission of the drug for 36 hours, and after this period a new preparation was tried out in each case. The idea was to eliminate the individual factors in absorption. The absorption rate may also vary from season to season. So the four preparations were tried out simultaneously to eliminate this seasonal variation factor. The medicine was administered at 8 A.M. on empty stomach, at 12 noon 1 hour after meals, at 4 P.M. and at 8 P.M. both times on empty stomach. The blood was taken at 2 hourly intervals in the mornings on Mondays and Tuesdays at 8 A.M., 10 A.M. and 12 noon —in the afternoons on Fridays and Saturdays at 2 P.M. 4 P.M. and 6 P.M. This time schedule was adopted to eliminate too many venepunctures in each patient. The blood was taken during the first 2 days of the week and during the last 2 days to see if the blood remained higher on prolonged administration of PAS. One patient (D) out of the original four who volunteered, backed out after one week's study (Fig. 5).

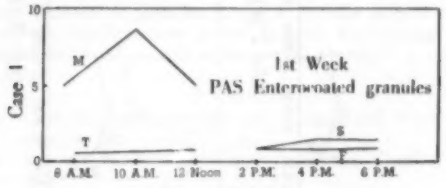

FIG. 5 (Case 4)

In the normals, the method of study was different. Four healthy volunteers were chosen. Each was given a different preparation in similar doses and almost at similar intervals as in the patient groups *i.e.*, 3 gm. four times a day at 8 A.M., 12 noon, 6 P.M. and 9 P.M. Blood was withdrawn at 2 hours' interval from 8 A.M. to 6 P.M. (6 times) and at 8 A.M. next day (Fig. 4). This slightly altered time schedule was devised to find out how long the blood level of PAS remained high after administration of one single dose of 3 gm.

The PAS in blood was estimated according to the method of Klyne and Newhouse (*Lancet* 2: 611, 1948). Oxalated whole blood was taken and was laked with distilled water. It was then treated with para-toluene-sulfonic acid; and to the filtrate was added citrate buffer solution and paradimethyl amino-benzaldehyde. The colour was matched with a photo-electric photometer using blue filter.

DISCUSSION

The PAS blood levels are shown in the accompanying graphs (Figs. 1-5). There are many points in the graphs which we cannot explain fully. The blood level of PAS in the same patient, using the same preparation varied from day to day. This may be due to variations in absorption rates. Professor Lehman (1949) ascribed these variations to variations in activity and pH of the intestinal canal. The PAS blood level also varied in the same patient when different preparations were used. And it differed in various patients when the same preparation was used. Usually, the blood level was lower at 4 hours interval after administration of 3 gm. PAS than after 2 hours interval; and in some cases the blood level reached the pre-administration level at 4 hours. In the majority of cases the blood level of PAS after 4 hours remained higher than the initial level. The same could not be said of normal persons who had PAS.

The pattern of curve in the normal group with different preparations was exactly similar (Fig. 4). It showed that after a 3 gm. dose the blood level of PAS estimated at 2 hourly intervals, reached its highest peak at 2 hours after PAS and returned to almost pre-administration level at 4 hours, 6 hours and 11 hours after PAS. From their uniform graphs and from graphs of some of the patients it may be reasonable to assume that blood level of PAS reached pre-administration level after 4 hours: and so an interval longer than 4 hours between two administrations is not recommended for maintaining an adequate PAS level in blood. The long gap at night (8 P.M. to 8 A.M.) is, therefore, not justifiable on the result of our findings.

Further, this study of PAS level in the blood of normal and diseased persons also proves that the calcium salt does not maintain a longer increased PAS level in blood than the sodium salt. In fact the graphs (Fig. 4) obtained by administration of calcium and sodium salts of PAS in the two normals are like mirror image of one another. The claim of many manufacturers that calcium salt is superior to sodium salt in maintaining a longer high blood level of PAS is thus not supported. The same remarks also apply to PAC tablets.

The enterocoated para-amino-salicylic acid preparation proved least absorbable in this series, both in patients (Figs. 1-3) and in normals (Fig. 4). We are conscious of the work done with this preparation in other countries and the high blood levels of PAS reached after its administration. Barton (1951) obtained good absorption curve after one single dose of 5 gm. We have used only 3 gm. for each dose. But in our study, its absorption curves have been systematically low. It may be that the enterocoating of the particular brand we used (though we obtained the sample direct from the manufacturers and not through any chemist—the risk of spurious imitation is thus eliminated) has resisted absorption of its contents. It may be that the coating prepared in a cold country has undergone chemical and/or physical changes in the tropics (though we used it in February—a cold month) rendering it unsuitable for absorption. This contention

is further supported by many independent local observers that the patients pass these granules unchanged in their stools. Even Professor Lehman (1949) has observed varying blood concentrations using enterocoated granules of PAS (as free acid) and he has ascribed these among others, to variations in the enteric coating of granules which differ from batch to batch.

The secrecy of the samples was maintained. One house officer took the blood and sent it to the laboratory with one letter only. Another officer (N. C. Das) estimated the PAS level in blood, without knowing whose blood it was and what preparations he was dealing with. Only at the conclusion of the full period of experiments, the identity of the person and that of the preparations were disclosed. The question of having any bias towards any preparation was thus completely eliminated.

Lastly, we confess that we have not attempted to study the effect of PAS on the course of tuberculous disease in this paper; but we have attempted to study the absorption of different PAS drugs under identical conditions. The number of cases studied is very small and no definite opinion on the absorption of the different preparations of PAS can be given. However, the results certainly indicate the trend of absorption in human blood of the different preparations.

Addendum

Since the last study, a second series of observations were made on a group of 4 more patients (E, F, G and H) for 3 weeks each, using similar dosage and similar blood estimation schemata. The drugs studied were sodium salt of PAS in cachet, enterocoated granules of acid PAS (Fig. 6), calcium p-aminosalicylate in granulate form, and sodium salt of PAS with a resin coating. The dosage was 3 gm. administered at 8 a.m., 12 noon 4 p.m. and 8 p.m., and the blood was examined at 2-hourly intervals as in the first series on Mondays and Tuesdays in the morning, and Thursdays and Fridays in the afternoon (*cf.*, in the first study blood was examined on Fridays and Saturdays afternoon). Three patients (E, F and G.) were administered one drug each week; so each patient received 3 drugs during 3 weeks; and there were 36 hours interval between administration of two drugs. One patient (H) received Sodium PAS in cachet for 3 consecutive weeks (Fig. 7). Again, the highest blood levels were found after administration of sodium salt of PAS in cachet; and the blood levels after administration of the other 3 drugs were lower, and more or less similar. Further, the calcium salt of PAS did not maintain a sustained blood level; and the blood level with this preparation of Ca was lower than that after administration of Calcium PAS in cachet during the first study.

Conclusions

From the study of absorption of 6 different preparations of PAS in 8 patients and in 3 normals, the following conclusions are drawn:

1. The blood level after administration of Sodium (or Ca) PAS in powder form is highest of all other preparations studied, and is more uniformaly high in different weeks than other preparations.

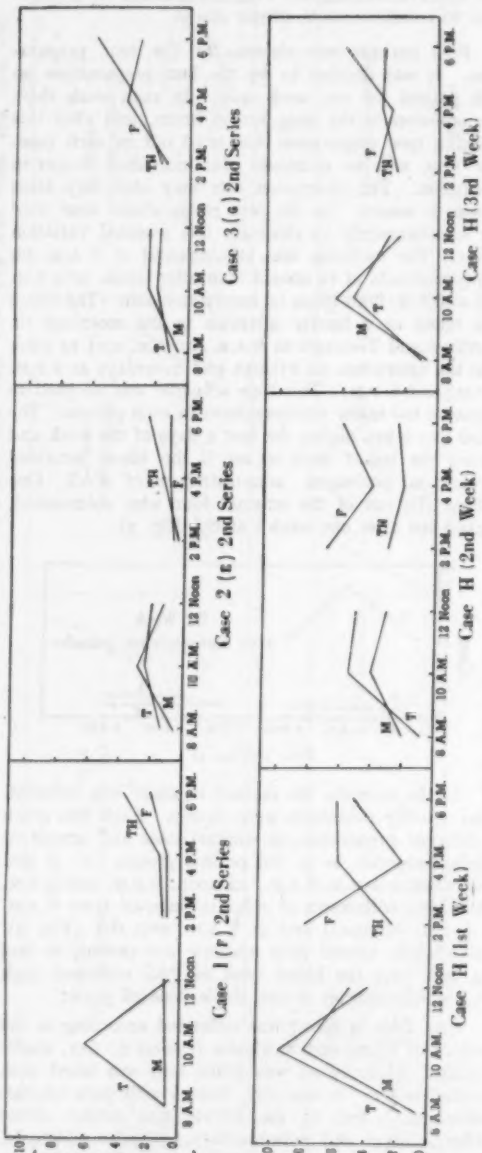
PAS Enterocoated granules
(3 Cases, E, F and G)
Case 1 (F) 2nd Series
Case 2 (E) 2nd Series
Case 3 (G) 2nd Series
Sodium PAS in Cachet in one patient (H) for 3 weeks
Case H (1st Week)
Case H (2nd Week)
Case H (3rd Week)
9 A.M. 10 A.M. 12 Noon 2 P.M. 4 P.M. 6 P.M. 8 A.M.
T M F TH

Fig. 6 Fig. 7

2. Even the blood level in the same patient with the same drug varies from day to day, and week to week (Fig. 7).

3. The absorption and excretion rates of PAS Sodium and PAS Calcium are similar—almost like mirror image (Fig. 4). The assumption that PAS level in blood is maintained over a longer period after administration of Calcium PAS is not corroborated by our experiments.

4. The absorption of PAS from enterocoated and resin coated preparations as estimated by blood level, is variable and is lower than those of Sodium and Calcium PAS in powder form.

5. The PAS level of blood after a single 3 gm. dose comes down almost to pre-administration level at the end of 4 hours. So the interval between two administrations of PAS should not be more than 4 hours.

ACKNOWLEDGMENT

We desire to thank the different manufacturers for free and liberal supply of their products, and the firms which supplied us free all chemicals required in these experiments. We also like to thank our House Staff, particularly Dr. S Dutta, who co-operated with us during the whole period, and to those patients and individuals (normals) who gave their blood voluntarily for the experimental study. We are grateful to the Principal, and Professor of Medicine of the R. G. Kar Medical College and the Superintendent of the Hospital for allowing us to make this study possible at the college hospital.

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EFFECT OF SPIROCHIN HYDROIODIDE ON SURGICAL AND INFECTIVE CASES

A Preliminary Note

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AND
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Ayurvedic and Unani literatures contain evidences about the efficacy of bark, root, leaves, etc., of *Moringa Pterygosperma* (Bengal—*Sajina*) in various types of diseases.

A few years ago, the Alkaloid Research Laboratories, Ltd., isolated the active principle of *Moringa Pterygosperma* and named it arbitrarily as spirochin. They produced in parenteral form spirochin hydroiodide in the brand name "Spirodin" and they claimed its beneficial use in various diseases.

The chemistry of this drug was studied extensively by Chatterjee in his unpublished work. The elaborate physiological properties were studied by Maitra, Das and Chatterjee (1948 and 1951) and Maitra and Chatterjee (1951*a* and *b*). Reviewing the above literatures it was found that this drug is worth a thorough clinical trial and as such it was taken up in R. G. Kar Medical College Hospitals, Calcutta, on a number of patients with various types of ailments.

The following were the cases where this drug was successfully clinically studied:

1 Cholecystectomy; 2 appendicectomy; 3 radical mastectomy; 4 subtotal gastrectomy; 5 subtotal thyroidectomy; 6 suprapubic prostatectomy; 7 herniorraphy; 8 hernioplasty; 9 eversion of sacs; 10 gluteal abscess; 11 ischiorectal abscess; 12 phagedenic ulcer; 13 lacerated traumatic wounds; 14 burns.

The drug was tried in 54 critically selected cases of various types of diseases as stated before and the beneficial effect was noted in almost every case. In the early trials the dose was 30 to 60 mgm. daily by intramuscular injection which later on was increased to 120 to 180 mgm. per day according to the severity of the infections. In some of the cases according to the severity of the infections in addition to the intramuscular injection, external application of sterile 5 per cent solution of spirochin hydroiodide was also used.

Among the 54 cases studied clinically the reports of 5 cases are mentioned below to show the effectiveness of spirochin hydroiodide.

CASE REPORTS

Case 1—L. S., Hindu female, aged 55 years, was admitted into the hospital with:

(1) Complete sloughing out of the right breast due to infection.
(2) Cellulitis.
(3) Offensive purulent discharge.
(4) Generalised anasarcaform nutritional deficiency.

There was no temperature.

The patient after admission received high protein diet and multivitamin tablets—6 such daily.

The wound being cleaned up was dressed with penicillin sulphamezathine powder and intramuscular injection of penicillin 3,00,000 units daily was given for combating the infection. The wound did not show any sign of improvement. The offensive discharge was still present after spraying locally with penicillin sulphamezathine powder. The patient became penicillin and sulpha drug resistant; the case being diagnosed as phagedena the wound was dressed with 5 per cent spirochin hydroiodide solution as a last resort with reluctance. Three days after the first dressing the wound was opened for checking up any improvement; there was hyperæmia and new healthy granulation tissue was found growing, the wound looked like a piece of raw ham—the discharge was scanty, the unhealthy granulation tissue was found fast disappearing; on subsequent dressings of the wound with 5 per cent solution, no discharge was found. The rapid epithelisation of the skin

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was noted, thereby diminishing the vast extent of the ulcer. As the area of the wound was very big we planned for skin grafting (Thiersch's method) but owing to the generalised bad condition of the skin of the patient, we could not do it. The wound was dressed on alternate days with 5 per cent solution of the drug in conjunction with intramuscular injection of 60 mgm. of spirochin hydroiodide daily for ten days. The patient was discharged after 7 weeks completely cured and the ulcer fully epithelized.

Case 2—K. D., Hindu male, aged 60, was admitted into the hospital with:

(1) Badly lacerated injury of the right foot.
(2) Fracture of the calcaneum.
(3) Crushed fracture of the 3rd and 4th metatarsal bones.
(4) The nutrient artery and medial plantar artery were found completely severed.

After the treatment of shock the wound was treated with intermittent suturing of the muscles with No. 1 catgut; the bleeding vessels being clamped, ligated. The skin and subcutaneous tissue were opposed with intermittent sutures at long intervals to avoid infection. Two split rubber drainages were given.

On the 3rd day the wound was opened up for removal of the rubber drainages but we observed extensive infection of the wound with areas of blackening due to ischæmic gangrene; the devitalised and the lacerated sole of the foot had peeled off and all the sutures were removed to release tension. As the gangrene was spreading, amputation of the right foot was suggested but owing to the very low condition of the patient, we had to treat the wound conservatively with local application of 5 per cent solution of the drug along with intramuscular injection of 120 mgm. of spirochin hydroiodide. On the 3rd day after local application of the solution, the wound was opened up and to our surprise we noticed growth of new healthy granulation tissue—the offensive smell of the wound was less and the sloughs were found markedly decreasing—the ischæmic condition of the skin was found disappearing. We resorted to dressing of the wound with spirochin hydroiodide solution soaked in gauzes after the sloughs were removed each time. During dressing of the wound, the intramuscular injection of 120 mgm. of the drug daily was continued for ten days and then discontinued. The local application of 5 per cent solution on the wound was carried out every 3rd day, the wound healing up progressively with rapid epithelization of the skin. On the 40th day of his admission, the patient left the hospital on risk bond with a healthy, healing wound and the sole almost completely reformed. Unfortunately he did not turn up for subsequent dressings and hence could not be followed up to the end.

Case 3—S. S., Punjabi, Sikh, male aged 32, was admitted with history of acute pain and tenderness in the perianal region for 12 days. He gave a history of rise of temperature of intermittent type since onset of the illness.

On examination he had increased temperature, swelling and all the signs of bilateral localising ischiorectal abscess.

For the first five days he was given 60 mgm. of spirochin hydroiodide intramuscularly every day. During this period he continued to have a hectic type of temperature. On the sixth evening of his admission it was decided that the abscesses had localised sufficiently to be surgically drained. This was done by one of us (R. C.) under light æther anæsthesia and a large quantity of foul smelling thick pus evacuated from either side (culture of pus showed presence of *B. coli* and *staphylococci*). The cavity was plugged with roller gauge soaked in 5 per cent aqueous solution of spirochin hydroiodide. Daily dressings with 5 per cent solution locally was carried out during the first five days with intramuscular injection of the drug as before. From the second post-operative day he had no temperature. From the 3rd dressing the wound was practically free of any discharge. Subsequent dressings were done on alternate days, as from the sixth day it was found that the wounds were absolutely dry and without any slough or other clinical evidence of infection. He was discharged as cured on the 17th day after incision.

Case 4—K. B., Hindu female, 80, was admitted with a badly lacerated injury on the right heel due to a lorry accident. The wound was treated conservatively and it developed extensive infection. Dressings were done every day with removal of sloughs as far as possible.

The spirochin hydroiodide solution for local use became available for clinical trial about the time when the infection had been partially controlled by penicillin and sulphonamide therapy. Since then the wound was dressed purely with gauges soaked with spirochin hydroiodide solution with 60 mgm. of the drug being given systematically.

The progress of the wound was very satisfactory and granulation tissue formed abundantly and exuberantly. A skin grafting was done by Thiersch's method by one of us (R. C.). Only a portion of the wound was covered as there were some doubts as to whether skin grafts would take at such an age and on such a wound. The grafted wound was dressed purely with local spirochin hydroiodide, even systematic use of the drug being stopped. There was remarkably complete "taking" of the grafts and epithelization was very satisfactory. Accordingly the rest of the wound was grafted with Thiersch grafts on a subsequent sitting.

Case 5—B. M., Hindu male, aged 50, who was admitted into the hospital with extravasation of urine for 7 days after rupture of strictured urethra.

On examination the penis and scrotum were found highly distended with pus; the skin of the penis and scrotum had at places given way resulting in serosanguinous discharge.

Cellulitis of the scrotum and penis was observed. The patient had temperature of 103·4°F. at the time of admission into the hospital.

Suprapubic cystostomy was done by one of us (S. K. G.). In addition to it two vertical incisions were given on the scrotum to let out the contents. Another vertical incision was given at the root of the penis. On incisions, offensive (fœtid smell) purulent discharge came out, the loculi being broken with finger the wound was packed up with roller gauze soaked in 5 per cent solution of spirochin hydroiodide. The whole skin of the scrotum and penis were covered up with gauzes soaked in 5 per cent solution. Intramuscular injection of 120 mgm. of the drug was given daily for ten days. The temperature touched normal after 48 hours of operation with 240 mgm. of the drug being injected intramuscularly.

On the 3rd day after the operation when the wound was opened up the discharge was scanty and the wound was found healing up with new healthy granulation tissue.

The pus on culture showed *B. coli* and *streptococci*, the wound was dressed every alternate day with 5 per cent solution. The skin of the scrotum and penis showed marked

improvement—rapid epithelization was observed. As the condition of the patient markedly improved, 30 mgm. of spirochin hydroiodide was given intramuscularly twice daily after 5th day instead of 60 mgm. twice daily, as a prophylactic against possible complications. The patient developed no complication. The wound healed up completely on the 8th day. The patient was discharged after dilatation of urethra on the 10th day after his admission with advice to attend the hospital for further dilatation.

Conclusions

At present a clinical appraisal of the effects of spirochin hydroiodide in the 54 cases under review may be put forward with the following conclusions—

1. It is effective in general and local forms in combating gram-positive infections, specially staphylococcal and streptococcal.
2. In the given doses it is non-toxic.
3. It has been observed to promote epithelization.
4. It might have an antipyretic side-action.
5. It has got some local analgesic effect.

From the above clinical studies this drug is found to possess sufficiently effective therapeutic properties, to deserve furthermore extensive trial and analysis.

Acknowledgment

We are grateful to Messrs. Alkaloid Research Laboratories Ltd., for their kindness in supplying us with abundant quantities of both the injectable and the local forms of the drug.

It has also been our privilege to discuss the properties of the active principle with Dr. S. R. Maitra, M.SC., D.PHIL., who has worked out the physiological properties and Sri Gouri Sankar Chatterjee, M.CH.E., who has investigated the physiological and chemical properties of the drug.

We thank Dr. Amiya Sen, M.B., F.R.C.S. (ENG.), D.P.H. (LOND.), Professor of Surgery and Visiting Surgeon, R. G. Kar Medical College and Hospitals, for his encouragement and his kindness in allowing us to give clinical trials of the drug.

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THE ACTION OF CHLOROMYCETIN ON THE PRODUCTION OF ANTIBODIES IN TYPHOID FEVER

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Ever since the discovery of chloromycetin and its therapeutic use in the treatment of typhoid fever, relapses were encountered by most clinicians in some of their cases. Cook and Marimon (1949) in their study of 25 cases treated with the drug have cited 3 cases which relapsed but subsequently were treated successfully. Wood *et al* reported two cases of relapse after an afebrile period of 10 and 16 days out of 15 cases. Laporte *et al* (1950), Gabinus (1950), Sedallion *et al* (1950), Hill *et al* (1950), Rankin and Grumble (1950), Ramli (1950), Briggs (1950), Good and Mackenzie (1950), have all reported such relapses and percentage varying from 10-30.

Some of these clinicians suggest that the relapses referred to may possibly be due to either inadequate dosage or to early withdrawal of the drug. Laporte *et al* (*loc. cit.*) suggest that the drug does not reach the lymph nodes easily and in sufficient concentration so much so when once the drug is withdrawn the organisms from these lymph nodes invade the blood stream and cause a relapse. Further, the absorption of the drug is so rapid from the upper parts of the intestine that the organisms in the lower reaches of the bowel remain viable and later invade the blood stream on discontinuing the drug.

Most of the published reports on treatment of typhoid fever with chloromycetin contain no reference to the development of antibodies in the host. Cook and Marimon (*loc. cit.*) suggest that in some cases relapse may be due to early diagnosis and treatment, prior to the development of immunity. Good and Mackenzie (*loc. cit.*) in their series of 6 cases examined sera for H,O and Vi agglutinins and could find no variation in these titres that could be attributed to chloromycetin. All their cases were admitted between the 8th and 14th day of the disease and treatment started after diagnosis. Probably the agglutinins are already present in the blood before treatment, as in cases of typhoid fever agglutinins usually begin to manifest by about the 7th to 10th day and very occasionally by the 5th day (Topley and Wilson 1948).

With these facts in view an investigation of the immunity response of the body as measured by the antibody titre whilst under chloromycetin treatment was carried out. Cases were selected wherein the diagnosis was established during the first week so that the agglutinins have had no time to form. Since the number of cases that come for treatment during the first week are very few, this series consists of only 11 cases studied during the period of two years.

TABLE I—SHOWING RESULTS OF INVESTIGATIONS

Case No.	Day of Diag.	Result of blood culture	Baseline Widal	Subsequent Widals 12th day	19th day	26th day	33rd day	40th day	Day of illness on which afebrile	Remarks
1.	5	B. Typhosum. isolated	To- 1/25	1/50	1/50	1/50	1/25	1/25	6th day	Stool & urine culture revealed no organisms of the enteric group.
			Th, Ah, Bh neg.	neg.	neg.	neg.	neg.	neg.		
2.	5	,,	To, Th, Ah, Bh neg.	neg.	neg.	neg.	neg.	neg.	7th day	No organisms of the enteric group isolated from stool & urine culture on discharge.
3.	3	,,	To, Th, Ah, Bh neg.	neg.	neg.	1/25 1/25	1/25 1/25	1/25 1/25	12th day	ditto
4.	6	,,	To, Th, Ah, Bh neg.	neg.	neg.	neg.	neg.	neg.	8th day	ditto
5	4	,,	To, Th, Ah, Bh neg.	neg.	neg.	neg.	neg.	neg.	9th day	ditto
6.	6	,,	To 1/25	1/25	1/25	1/25			6th day	ditto
			Th 1/25	1/50	1/50	1/50				
			Ah, Bh neg.							
7.	4	,,	To, Th, Ah, Bh neg.	neg.	neg.	neg.	neg.	neg.	12th day	Relapsed on the 20th day of illness. Blood & stool culture negative. Responded to further treatment with chloromycetin.
8.	5	,,	To 1/25	1/50	1/50	1/50	1/50		8th day	Relapse with hæmorrhage on the 23rd day. Responded to further treatment with chloromycetin.
			Th	neg.	neg.	neg.	neg.			
			Ah, Bh neg.							
9.	4	,,	To, Th, Ah, Bh neg.	neg.	neg.	neg.	neg.	neg.	8th day	No organisms of the enteric group isolated from stool or urine on discharge.
10.	5	,,	No agglutinins against To, Th, Ah & Bh detected during the 33 days.						9th day	ditto
11.	6	,,	No agglutinins against To, Th, Ah & Bh detected during the 26 days.						9th day	ditto

To = B. Typhosus O suspension. Ah = B. Paratyphosus 'A' H suspension. neg. = No agglutination.

Th = B. Typhosus H suspension. Bh = B. Paratyphosus 'B' H suspension. *N.B.*—Bacterial emulsions from Armed Forces Medical College, Poona.

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The following routine was followed in the investigations:

(1) Diagnosis established by blood culture and at the same time a base line Widal against the common enteric group of organisms done.

(2) Schedule treatment with chloromycetin started on the day of diagnosis and continued so that the patients had chloromycetin at least for 10 days after they became afebrile.

(3) Agglutination reaction performed at the start and thence every week till such time that the patient was available.

(4) Routine stool and urine culture done after cessation of treatment.

The results of the above investigations are given Table 1.

Discussion

The number of cases studied in this series are too few to lead to a definite conclusion. It appears from the results that agglutinins developed in cases of typhoid fever, where chloromycetin was exhibited early, were nil or of a very low titre. Since the action of chloromycetin on *S. typhosum* is only bacteriostatic the non-development of antibodies could only be explained by assuming that the drug denatures the antigens in the bacteria in such a way that it does not elicit the production of specific antibodies. Good and Mackenzie (*loc. cit.*) were able to detect the agglutinins in their series of cases because by the time the treatment was started (on an average the 13th day of disease) the antibodies probably have already started appearing in the blood.

The ultimate recovery in these cases would depend on the phagocytic power of the host and prolonged exhibition of the drug. The relapses in the series may be due either to inadequate period of treatment or to lowered phagocytic power of the host.

Summary

(1) Agglutination reaction against salmonella Typhosum studied in a series of 11 cases of typhoid fever diagnosed during the first week and treated with chloromycetin.

(2) In this series the level of agglutinins in the blood is nil or very low.

(3) Possibly chloromycetin denatures the bacteria and prevents the formation of specific agglutinins.

Acknowledgment

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DIETARY STUDY OF AGRICULTURAL LANDLESS LABOURERS OF BHABHUA (BIHAR)

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A comparative study of the dietary habits of the agricultural landless labourers, those engaged in profession, and farmers, residing in the same locality has not so far been made. The results of such a study has been reported in this paper. There is yet another reason for which this particular area was selected for survey and that is, the population of the area was in the habit of consuming raw homepounded rice and an attempt has been made to assess the level of consumption of raw rice and its effects, if any.

Method of Enquiry

The diet of 109 families residing in the three contiguous villages, Mohania, Bhabhua, and Khalaspur in the Bhabhua sub-division, district Shahabad (Bihar), consisting of landless labourers, persons engaged in profession and business but owning no land and farmers, comprising a total of 541 persons was surveyed. In the three villages the percentage of the total families surveyed was 58·1, 40·7 and 60·9, respectively. The families engaged in business or profession consisted of barbers, tailors, shopkeepers, blacksmiths, washermen and rural school teachers. All these were parts of the economy of the villages. The landless labourers were low class Hindus and Harijans. The farmers were upper class Hindus. The survey was done in April-May, 1949, for 10 days on lines as reported earlier (Lal, 1950) and the data was collected by house to house visit at the time of preparation of each meal. All food ingredients were weighed in raw state.

Economic Status

Data regarding income in case of farmers were collected by evaluating the cost of crops produced on the basis of prevailing market rates. In the case of landless labourers and persons engaged in profession the income was assessed according to the technique adopted by Mitra (1940).

The consumption co-officient was worked out as suggested in the Health Bulletin No. 23 (1951). Table 1 gives the average daily income and the consumption units in the three types of families surveyed.

All the farmers owned lands, the other two categories of families were entirely landless. Thirty of the farmers' families had milch cows while those in II and I had only 5 and 1, respectively. One family in group I had a she-goat for its supply of milk.

Classes of Foodstuffs Consumed

Intake per consumption unit of the various classes of foodstuffs in the three types of families is shown in Table 2. The average number of foodstuffs entering in their diet was 5. The details of the types of cereals consumed have been given in the table as proposed by the I.C.M.R. (1951) and consumption level has been compared with the suggested standards for the Indians in the Report of the Nutrition Advisory Committee, I.R.F.A. (1944).

Figures in Table 2 have been further analysed to show the actual intake of the "protective foods", by the families in the various groups and shown in Table 3.

Cereals—Rice consumed was raw and home-pounded; barley and wheat were the other cereals which entered into their dietary. The consumption of wheat was, however, confined to groups II and III only.

Table 1.—Showing Consumption Units and Income of the Three Categories of Families

Group	Class of family	Total No. of Families	Total No. of Consumers	Total c.u.	Average c.u. per family	Income/c.u./day in annas		
						Average	Maximum	Minimum
I.	Landless labourers	40	251	188·0	4·7	15·7	18·0	11·0
II.	Engaged in profession	37	150	146·6	3·9	20·6	31·5	11·6
III.	Farmers	32	140	130·8	6·4	20·0	40·0	12·6

c.u. = consumption unit.

N.B.—Henceforth groups instead of detailed name of class of families will be mentioned.

Table 2—Showing Daily Average Consumption of Various Foods (Ounces per Consumption Unit)

Groups	Cereals			Pulses	Vegetables		Fats & Oils	Flesh foods	Milk & milk product	Fruits & nuts	Condiments	Other foods
	Rice	Wheat	Barley		Leafy	Non-Leafy						
I.	9·6	0·0	7·2	5·6	0·7	2·4	0·3	0·9	0·6	0·2	0·4	0·4
II.	9·8	6·6	2·8	4·0	0·9	3·2	0·4	1·0	1·8	0·2	0·6	0·5
III.	10·7	7·1	1·1	3·8	0·6	3·8	0·4	0·6	4·1	0·2	0·6	1·2

Table 3—Showing the Frequency Distribution of Families Consuming Varying Quantities of Protective Foods

Consumption in ounces/c.u./day	Leafy vegetables			Flesh foods			Milk and Milk products			Fruits		
	I	II	III	I	II	III	I	II	III	I	II	III
Nil	50·0	35·3	45·4	7·5	10·8	31·8	72·5	32·4	13·6	52·5	75·7	81·8
up to 0·5	7·5	0·0	4·5	12·5	10·8	0·0	5·0	0·0	4·6	42·5	13·5	0·0
up to 1·0	12·5	18·9	22·7	35·0	35·1	40·9	12·5	13·5	0·0	2·5	8·1	9·1
up to 2·0	17·5	40·5	22·7	45·0	35·1	27·1	9·0	27·0	13·6	0·0	2·7	4·5
Above 2·0 & up to 9·0	12·5	5·4	4·5	0·0	8·1	0·0	3·0	27·0	68·1	2·5	0·0	4·5

Pulses—Red gram, Bengal gram, lentil and khesari (*Lathyrus sativus*) were the pulses consumed. The maximum quantity of khesari consumed by the families per c. u. per day was only 0·4 ounce. There was no consumption of this pulse in group III and very little in group II.

Leafy vegetables—In all the three groups the consumption of leafy vegetables was much below the prescribed standard. The types consumed were amaranth leaves, leaves of creepers like pumpkin (*cuburbita maxima*) and gourd (*lagenaria vulgaris*).

Non-leafy vegetables—Consumption was comparatively more in group III and least in group I, though the intake in all groups was below the suggested standard. Potato, brinjal, tomatoes were the vegetables consumed by them. These were home-grown.

Fats and oils—Mustard oil was the fat used. Ghee was consumed by families in group III and by some of those engaged in profession and having a higher income.

Flesh foods—Fish and goat's meat were the flesh foods consumed.

Milk and milk products—The families surveyed were found to consume liquid milk and its various preparations, specially curd. Table 3 shows a comparatively much higher intake amongst the farmers than amongst others. This was natural too, as a large number of such families possessed milch cows. It was possibly not feasible for persons in groups I and II to purchase and consume milk because of the high cost beyond the scope of their income. The total milk consumed by the families in group I, II and III was, 80·5,

29·8 and 28·0 per cent respectively, and was in the form of skimmed milk.

Fruits and nuts—Mangoes (*Magnifera indica*), the seasonal fruit, was being consumed.

Condiments—These included chillis, turmeric and black pepper.

Other foods—Jaggery was the main article consumed.

Proximate Principles

The consumption of foods entering into the diet of the families surveyed was calculated for their various nutrients according to Health Bulletin No. 23 (1951). Table 4 shows the intake.

Actually the intake of the nutrients in all the families of any group was not deficient and hence the figures in Table 4 have been further analysed and the

Table 4—Showing the Intake of Nutrients and Calories per Consumption Unit per Day

Groups	Protein in gm.	Fat in gm.	Carbohydrates in gm.	Calcium in gm.	Phosphorus in gm.	Iron in mgm	Vitamin A I.U. in term of carotene	Vitamin B_1 in mgm.	Vitamin C in I.U.	Calories
I.	87·2	19·7	479·0	0·54	1·7	38·2	2364	2·0	52	2439
II.	88·7	25·4	517·0	0·55	1·8	42·0	2142	2·2	63	2656
III.	87·1	26·3	520·0	0·61	1·8	40·2	2761	2·9	54	2679

Table 5—Showing the Frequency Distribution of the Families, given in Percentage of Each Group, Consuming Varying Quantities of Nutrients per C. U. Against the Standard Amounts given in Brackets

	Protein (82 gm.)				Calcium (1·0 gm.)			Iron (20 - 30 mgm.)		
Group	58-81 gm.	up to 90 gm.	up to 100 gm.	up to 112 gm.	0·2-0·5 gm.	up to 0·9 gm.	up to 2·0 gm.	20-30 mgm.	30-40 mgm.	over 40 mgm.
I	20·0	37·5	25·0	17·5	35·0	65·0	nil	10·0	70·0	20·0
II	13·5	29·7	40·5	16·3	28·8	69·4	2·7	5·4	37·8	56·7
III	7·5	66·6	19·1	4·8	42·9	47·8	9·5	4·7	47·6	47·6

	Vitamin A (3000-4000 I.U.)				Vitamin C (50 mgm.)		
Group	500-1000 I.U.	up to 2000 I.U.	up to 3000 I.U.	up to 4000 I.U.	Vitamin B_1 (1·0-2·0 mgm.)	20-50 mgm.	over 50 mgm.
I	47·5	15·0	12·5	25·0	100·0	60·0	40·0
II	32·4	13·5	18·8	35·1	100·0	43·2	36·8
III	47·6	9·5	33·3	9·5	100·0	47·6	52·4

N.B.—Figures in brackets indicate the dietary allowances as recommended by the Nutrition Advisory Committee I. R. F. A. (Health Bulletin No. 23, 1950.)

proportions of families in each group consuming such nutrients in different quantities have been shown in Table 5 against the standards suggested for Indians by the Nutrition Advisory Committee (1944), which are given in brackets.

Protein—The protein derived from food was mostly from vegetable sources, the total consumption of animal protein being 5·9 gm., 7·4 gm., and 7·4 gm., respectively, in the three groups, derived from milk, meat and fish. This was much below the recommended dietary allowance for this country, although the total protein intake was well above the recommended dietary allowance of 82 gm. being mostly derived from rice and hence of high biological value.

Fat—The small variation in fat intake between the groups, specially II and III, was due to the consumption of skimmed milk as stated earlier.

Calcium—Intake of calcium was low. It only confirms the earlier findings of this laboratory that the diet of Beharees living in rural areas is deficient in calcium (Lal, *loc, cit*; Mitra, 1942.)

Iron—Intake of iron was above the recommended dietary allowance of 30 mgm.

Vitamin A—Intake was lower than the recommended allowance of 3000-4000 I.U. per c.u./day, group II families faring a little better than the families of the other two groups.

Vitamins B, and C—Intake of these two vitamins in all the groups was adequate.

Calories—The intake of calories in group I was lower than the suggested standard of 3000 for the Indians engaged in moderate work. There were 18 families consuming less than 2500 calories a day. The maximum and minimum intake of calories was 3037 and 1801, respectively. The corresponding figures for groups II and III were 3773, 2092 and 3389, 2099, respectively, while there are only 5 and 2 families in the two respective groups consuming less than 2500 per c.u. per day. The average intake in groups II and III was adequate considering that they could be put in between the category of light and moderate workers.

Assessment of Nutritional Status

The children, between ages of 3-14 years, of the families surveyed were examined for the presence of defects supposed to be due to lack of nutrients. A total of 214 boys and 149 girls were examined. The children were rated according to their general physical appearance and nutritional status as per technique suggested by the Nutrition Advisory Committee (1948). The results are given in Table 6.

Table 6—Showing Rating of Children according to the Grades Proposed by the Nutrition Advisory Committee (1948)

	Boys		Girls	
Grade	*Actual*	*Percentage*	*Actual*	*Percentage*
0	52	24·3	39	26·2
1	111	51·8	71	47·6
2	38	17·7	28	18·6
3	13	6·1	11	7·4

The children were further examined in detail for signs of nutritional defects. Only a few of the deficiency diseases were detected as shown in Table 7.

Table 7—Showing Percentage Distribution of Incidence of Deficiency Diseases Among Children, by Sexes

Sex	*Xerosis*	*Angular stomatitis*	*Phrynoderma*	*Caries*	*Total*
Boys	0·9	1·4	4·2	8·4	14·9
Girls	0·7	Nil	Nil	12·4	13·1

Discussion

Compared with the standard suggested by Nutrition Advisory Committee (1944) the diet of all the groups was found lacking in quantities of the protective foods, *viz.*, leafy vegetables, milk and fruits. Except for the deficient intake of calcium and animal protein, the diet, as a whole, was otherwise not bad. Of the three groups the landless labourers requiring the highest amount of calories were getting the least and their intake was lower than the two other groups. As an overall picture there was slight difference in the intake in groups II and III.

As stated earlier, the population surveyed was consuming rice which was raw and home-pounded. It constitutes 57·1, 51·0, and 56·6 per cent of the total daily cereal intake in groups I, II, and III, respectively. No milled rice was consumed. Out of the total vitamin B_1 intake (Table 3), the quantity available from rice only was 0·49, 0·49 and 0·52 mgm. in three respective groups, while the rest of it was derived from cereals, pulses and other foods. Even if only 35 per cent of the vitamin B_1 of the rice, after making allowances for the losses in washing and cooking by the method practised in Indian homes, were available (Aykroyd *et al*, 1940), its daily intake would still be within the range of the standard suggested by the Nutrition Advisory Committee of Indian Research Fund Association (1944). No manifestation of vitamin B_1 deficiency was observed in the population surveyed and this was expected in view of the adequate intake of this vitamin particularly when nearly half of the cereals consumed was wheat and/or barley and the rice was home-pounded and not milled.

Children of the families surveyed exhibited only a few of the signs supposed to be due to the deficient intake of nutrients. Such small number of children showing signs of nutritional defects and the low percentage of them in grades 2 and 3 was not recorded in some of the earlier surveys done in this State (Lal, 1950, *a* and *b*); Mitra, 1940, 1942). This may be ascribed to the better intake of nutrients.

The survey was done in a particular season of the year. It is a fact that energy expenditure of agricultural labourers varies with the agricultural season. Very little agricultural work was going on during the time of survey. It may be that in view of the type of work that the members of group I were doing, the consumption level as reported, was enough to meet the body needs, or that their body requirements had been geared at a lower physiological level. These facts could be clarified by a repeat survey of the population at varying seasons of the year.

Summary

1. Diet survey of three types of people, viz., landless labourers, those engaged in profession and farmers, was carried out in April-May 1949.

2. The average consumption of nutrients except calcium and animal protein in all the three groups was adequate.

3. Consumption of calories was low in the case of the landless agricultural labourers and adequate in others.

4. Farmers were consuming the highest quantity of milk.

5. Intake of raw home-pounded rice did not reveal any signs of B_1 deficiency, for reasons given in the text.

6. Only a small percentage of children showed nutritional defects. They were well nourished in comparison with those surveyed in some of the other areas of the State.

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PRACTITIONERS' CORNER

EARLY DIAGNOSIS OF CARCINOMA

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Carcinoma, if detected early, can be radically cured to-day either by surgery or irradiation (deep x-ray or radium); if it is advanced, only a few of them can be successfully tackled. Success, therefore, rests with the early cases, i.e., so long as the disease remains localised and confined to the area affected having no spread to the other structures. Diagnosis must be made as soon as it affects the body. There are many difficulties in the early diagnosis and a number of factors is concerned:—

1. *The disease itself*—Carcinoma is a curse from God. It is perhaps His intention that the disease should attack silently and spread stealthily until it becomes deep-rooted when, even if it is detected, nothing can be done. It may be for this reason that *cancer is painless* in most situations and in most types. When a patient gets a tiny abscess, he at once consults his doctor as there is pain; when he gets a carcinoma, he does not feel the necessity of consulting a doctor. The early features of all cancers are so insignificant that they do not create any urgency for the relief.

2. *The patient*—The early symptoms of all carcinomata being insignificant and negligible, the patient does not consult his doctor. He remains negligent of his disease until some complications such as pain, bleeding, etc., compel him to seek an expert opinion, which is often expressed as 'a hopeless cancer.' In this connection I remember a woman who is a graduate of Calcutta University. She came to me for a lump in the breast—an advanced carcinoma. When I enquired why she remained silent about it, she said as it was not giving her any trouble she did not consider it worthwhile to take any medical opinion about it.

3. *The practitioner*—Even if the patient consults his attending doctor, it may be sometimes that the sad ignorance on the practitioner's part gives the disease time to progress to the hopeless state. It pains me to say that quite a good number of cases of bleeding per anum is being treated for piles and as the bleeding can no longer be controlled by the usual piles-ointments, a specialist is called who does nothing but puts a finger in the patient's rectum and with a grave expression he discloses to the surprise of all concerned that it is an advanced case of carcinoma of the rectum. The practice of prescribing piles-ointments to all patients coming with bleeding per rectum, without rectal examination, cannot be too strongly condemned.

Although a carcinoma may affect any part of the body, yet there are certain places where its occurrence is well-known and should be suspected whenever the symptoms point to those regions. The common places are lips, mouth (including cheeks, gum, palate, fauces and floor of the mouth), tongue, pharynx, larynx, bronchus, lungs, œsophagus, stomach, cæcum, colon, pelvi-rectal junction, rectum and anal canal. In addition to these, the breast and uterus are common sites in females.

LIPS, MOUTH AND TONGUE—Cancer here usually commences as a sessile cauliflower growth or an ulcer with a raised and rolled-out margin, having an indurated (hard) base. Sometimes, a crack or fissure after remaining stationary for some time turns to be a carcinoma. The features which are highly suggestive are (*i*) painlessness, (*ii*) indurated base and (*iii*) its growing nature defying all treatment. It must be remembered that involvement of lymph nodes is a late feature and diagnosis must on no account be deferred since lymph nodes are not enlarged.

LARYNX—When an elderly person complains of hoarseness of voice that does not clear up within a fortnight of treatment, a diagnosis of carcinoma of the larynx should be made unless proved to be otherwise by laryngoscopic examination. In extrinsic growth, the patient comes more often to show a swelling in the neck (metastasis in lymph nodes) just below the angle of the jaw. Dysphagia and hoarseness of voice appear later. Pain is the last feature.

BRONCHUS AND LUNGS—Unfortunately, there is no definite clinical indication of a bronchogenic carcinoma. Some of the common pulmonary symptoms, such as cough, pain in the chest, hæmoptysis, will be present. There may or may not be any sign of consolidation or effusion in the pleural chamber. Whenever there is any

suspicion, investigations, such as skiagraphy, aspiration biopsy and bronchoscopy, must be carried out.

ŒSOPHAGUS—If a carcinoma of the œsophagus has to be diagnosed only, investigations should be carried out whenever a man above 40 complains of heaviness or oppression behind the sternum at the time of meals. Steadily increasing dysphagia first with solids and then with liquids will be complained of when the disease is well established and beyond a radical treatment. Vomiting or rather regurgitation of food from the œsophagus is a very late feature. X-ray with barium meal and œsophagoscopy are the most useful investigations.

STOMACH—Although the clinical picture varies according to the type of carcinoma yet it may be said in a general way that when a man over 35, *who had been perfectly well before*, begins to complain of (*i*) discomfort or heaviness over the epigastrium after meals (not actually pain), (*ii*) loss of appetite and (*iii*) a feeling of weakness, one should suspect carcinoma of the stomach even if no lump is felt in the epigastrium (since the swelling may be hidden under the liver). In the case of pyloric growth, the patient is comparatively lucky as vomiting occurs early and demands a thorough investigation. The lump, if present, is found in the epigastrium or right hypochondrium; it is firm, irregular and tender moving with respiration.

However at the slightest suspicion of the disease such investigation as gastric analysis for achlorhydria x-ray with barium meal for constant 'filling defect' in a series of films, examination of stool for occult blood, examination of gastric lavage for malignant cells, etc., must be carried out.

CÆCUM—The patient is usually above 40. A lump in the right iliac fossa may be the first indication of carcinoma of the cæcum. Sometimes, there is alternate constipation and diarrhœa. Although the tumour is of the proliferating type, growing towards the lumen of the cæcum, yet intestinal obstruction is not an early feature since the content is fluid in nature. The lump needs to be differentiated from hyperplastic ileocæcal tuberculosis in which (*i*) the patient is younger, (*ii*) the duration is long with intermission in attacks and (*iii*) there may be tuberculous manifestations in the lung or lymph nodes, with evening rise of temperature. X-ray with barium meal will show "filling defect" in either case.

COLON—In colonic carcinoma, a lump in the line of the colon and subacute intestinal obstruction are the distinguishing features. In the late stage, the patient may come with a pericolic abscess or with an attack of acute-on-chronic intestinal obstruction. Skiagraphy with barium enema in non-acute cases is helpful in determining the site of growth.

RECTUM AND PELVIRECTAL JUNCTION—The patient is usually an adult; but the incidence of rectal carcinoma in the young is quite common. There is an *alteration of bowel habit*—the nature of alteration depends on the position of the growth—whether occurring at the pelvirectal junction, in the ampulla or in the anal canal. Since the growth at the pelvirectal junction is usually of the annular type, increasing constipation developing in one who had regular bowel habit is the earliest symptom. The very presence of growth in the ampulla causes a sensation of fullness in the rectum and the patient feels that his bowel has not been completely emptied after defæcation. As the growth ulcerates, an accumulation of mucus, pus, blood and fæces occurs during the night and on rising from the bed the patient gets a sudden urgent call to stool—this is called spurious morning diarrhœa. A growth in the lower part of the anal canal may alter the shape of the stool which becomes either pipe-stem or tape-like in form. It must be remembered that *pain is absent* especially when the growth lies above the Hilton's line. Sometimes, *bleeding per anum* is the first symptom and as has been mentioned previously an erroneous diagnosis of piles only is made.

Diagnosis is confirmed simply by a digital examination of the rectum. It is unfortunate that this simple examination is very commonly neglected. Even when the growth is situated at the pelvirectal junction, the finger can palpate the hardness of the constriction not unlike a very hard cervix uteri. The patient should lie on the right side since in this position the pelvirectal region tends to fall downwards and towards the anus and can be reached by the examining finger. In the ampulla the growth is proliferating or papilliferous in type or may present as an excavated ulcer having indurated and everted edges often bleeding readily at the time of examination.

BREAST—Four of every five tumours of the breast are carcinomata. When a patient comes with a lump in the breast, our attempt should be to find out any point against the diagnosis of carcinoma. It may be said that when there is a lump in the breast as determined by palpating with the flat of the hand (and not with the thumb and fingers) and when the lump is painless, (stony) hard and irregular on the surface and at the margin, a diagnosis of carcinoma should be made. Retraction of the nipple and fixity to the skin and deeper structures (pectoral muscles and chest wall) are late features of the disease. Every attempt should be made to diagnose carcinoma before its invasion to the axillary lymph nodes; therefore, absence of lymphatic involvement must not be considered as against the diagnosis of carcinoma.

UTERUS—Here again the early features are often insignificant—there may be leucorrhœa or slight hæmorrhage. It cannot be impressed too strongly that a sanious vaginal discharge about the menopause especially in multiparæ calls for a thorough vaginal examination. Pain, offensive discharge, fever, etc., are late features of the disease.

In conclusion, it may be emphasised again that whenever the patient presents features suggestive of carcinoma (or at the slightest suspicion of the disease),

he or she must be subjected to a thorough investigation and watched periodically. It is by this means alone that an early diagnosis of this deadly disease can be made. Unless an early diagnosis is made, carcinomata cannot be treated successfully.

NEW DEVELOPMENTS IN THE DIAGNOSIS AND TREATMENT OF CONGENITAL HEART DISEASE*

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It is a well-known fact that it is only within recent years (a little over a decade in fact), that the subject of congenital heart disease has entered into the domain of the clinical cardiologist. Prior to this, most clinicians were content with a diagnosis of 'Congenital Heart Disease' and even this was considered venturing too far into the unknown.

There are three reasons for the recent impetus given to the study of the subject:

Firstly, and most important, the foundations were laid by the clinicopathological contributions of well-known workers such as Keith, Maude Abbot, Laubry and Pezzi, and within recent years, Brown and Helen Taussig. To these workers we owe not only descriptions of several of the malformations, but also a correlation of clinical symptoms with autopsy findings.

Secondly, there has been the perfection of new techniques for the study of cardiovascular hæmodynamics such as cardiac catheterisation and angiocardiography. These two techniques have fairly well revolutionised our ability to diagnose complicated cases of congenital heart disease ante-mortem, and that is saying a great deal, as formerly a diagnosis was only possible on the autopsy table.

Lastly, the development of surgical techniques to correct some of these malformations stimulated a great deal of interest in the subject. The advent of surgery made it imperative that diagnosis be more exact, and to arrive at the correct diagnosis (no easy matter in complicated congenital malformations of the heart) every weapon in our armamentarium has been used.

The result of all this has not been, as one might suppose, a mere accumulation of diagnostic criteria for the specialist. Its most important result, to my mind has been for the general physician, who is now able to diagnose a wide variety of congenital lesions with a fair degree of accuracy. For this purpose, the elaborate techniques mentioned earlier are not necessary. A stethoscope, x-ray facilities and an electrocardiograph are all that are needed. The x-ray and electrocardiograph part of it will have to be stressed, as these are well-nigh indispensable—particularly in the case of children.

I shall deal in this paper chiefly with the cyanotic type of congenital heart disease, a group that has received a lot of publicity under the name of 'blue babies' in the lay press.

It is not often realised that all blue babies are not alike and that all blue babies are not operable. About 74 per cent of cases of cyanotic congenital heart disease fall into the category of tetralogy of Fallot. Of the remaining 26 per cent, little was known until recently. We now know how to diagnose a great many of these 26 per cent with reasonable accuracy, and what is more, some of them can be relieved by surgery.

The conditions to be discussed below are all cases showing cyanosis. With the help of the stethoscope, x-rays and electrocardiograph, it is possible to make an exact diagnosis in most of these cases.

Tetralogy of Fallot

The pathological features of this malformation are, pulmonary stenosis, (valvular or infundibular), ventricular septal defect, dextroposition of the aorta (which thus arises from both ventricles) and hypertrophy of the right ventricle.

The clinical features are cyanosis from birth or shortly after birth, clubbing of the fingers and varying degrees of disability on exertion. They also exhibit a phenomenon stressed by Taussig, which is present in about 4/5ths of the cases, viz., squatting. After even slight exertion, these patients regain their breath by sitting down on their heels. Examination of the heart does not reveal enlargement. There is usually a systolic murmur at the base, accompanied by a thrill. The pulmonary second sound is diminished. There is usually a polycythæmia of about 6 to 9 million red cells and a hæmatocrit reading of 60 to 80. The electrocardiogram shows right axis deviation and right ventricular hypertrophy in the limb and præcordial leads respectively. The radiological appearances are characteristic, although in an infant the heart may appear normal at first glance. There is usually a heart of normal size with a concavity in the region of the pulmonary arc and an uptilting of the apex in the A-P view. The shadow of the great vessels is narrow. In the right anterior oblique position, the right ventricle is seen to be enlarged and projects towards the anterior chest wall. The concavity of the pulmonary arc is also brought out in this view. In the left anterior oblique position, the right ventricular enlargement is obvious, as is the clear pulmonary window, which is a significant feature. With a barium swallow, the side of the aortic arch is made out. In about 20 per cent of cases of tetralogy, the aorta arches on the right side. The lung fields are abnormally clear and the hilar vessels show no pulsation on radioscopy. In older children, the hilar shadows may be increased owing to the development of

* Being a paper read at the 27th All-India Medical Conference at Sholapur, Deccan, on the 27th December, 1950.

the collateral circulation, but these shadows again never show pulsation on radioscopy.

Tricuspid Atresia

The pathological features of this condition are a maldevelopment of the tricuspid valve and a corresponding defective development of the right ventricle and pulmonary artery. There is always some communication between the two auricles—either a patent foramen ovale or a large defect in the auricular septum, as a blood cannot leave the right auricle otherwise.

Clinically the picture is very similar to the tetralogy. Cyanosis is usually intense and pulsation of the liver may be detected at its margin.

The electrocardiogram, however, shows left axis deviation and left ventricular hypertrophy in the limb and præcordial leads respectively. This is diagnostic in a cyanotic case.

The radiological appearances in the A-P view are very like a tetralogy, viz., normal sized heart, concave pulmonary arc and clear lung fields. In the left anterior oblique view, however, the left ventricle is seen to be enlarged and the shadow of the right ventricle does not extend beyond that of the aorta. The pulmonary window is very clear.

Truncus Arteriosus

In this condition blood from both ventricles is pumped into a common pathway from which arise the blood supply to both the pulmonary and systemic circulations. I am referring here to both the true and pseudotruncus arteriosus.

The clinical features are as in the tetralogy. Sometimes a clue is afforded by the presence of a continuous murmur at one or both lung bases. This sign, due to the collateral circulation, is not always present.

The electrocardiogram shows right axis deviation and right ventricular hypertrophy. The radiological appearance is characteristic. In the A-P view the heart is enlarged both to the right and the left. The pulmonary conus shadow on the left border is concave. The aortic shadow is broad and conspicuous to the left of the sternum. The hilar shadows are diminished and there is no pulsation in the lung fields. In the LAO, the picture is diagnostic. There is a shelf formed by the upper margin of the right ventricle at its junction with the aorta which is peculiar to this malformation and found in no other condition. The aorta is very broad and prominent. Barium swallow shows the aortic indentation to be prominent; in addition, there might be additional œsophageal indentations due to collateral vessels, which are of diagnostic significance.

Transposition of the Great Vessels

In this malformation, the aorta arises from the right ventricle and the pulmonary artery from the left ventricle. Thus blood from the right ventricle is pumped out *via* the aorta into the systemic circulation and blood from the left ventricle into the pulmonary circulation. To be compatible with life even for a short time there must be some intercommunication between the blood in the two systems, such as an interventricular septal defect, an atrial septal defect, a patent ductus arteriosus or anomalous pulmonary veins draining into the right auricle.

In a series investigated at the Johns Hopkins Hospital, the average duration of life was 19 months. One solitary case is recorded to have lived up to 56 years.

The outstanding clinical features of this condition are cyanosis from birth, cardiac enlargement on examination and pulmonary congestion.

The electrocardiogram shows right axis deviation and right ventricular hypertrophy, although sometimes there is a balanced axis.

The x-ray appearances are diagnostic. In the A-P view the heart is seen to be enlarged to both the right and the left. There is a concavity in the region of the pulmonary conus. The shadow of the great vessels in this view is narrow. In the LAO, there is enlargement of both ventricles. The shadow of the great vessels now is very much broader, a significant diagnostic feature. The lung fields show hypervascularity, in contrast to the conditions hitherto dealt with and pulsation of the vessels can be seen on radioscopy.

Valvular Pulmonary Stenosis

Last of all I shall deal with this condition which has now been recognised as a distinct clinical entity. In this malformation, there is valvular stenosis of the pulmonary artery, as opposed to infundibular stenosis. There is great enlargement of the right auricle and

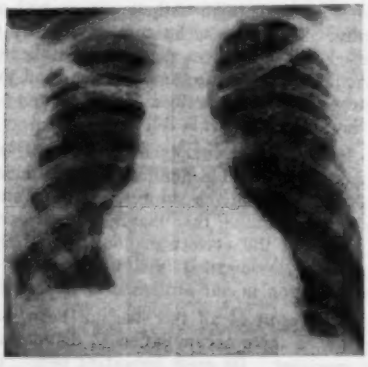

Fig. 1—Valvular Pulmonary Stenosis. Note Cardiac Enlargement, Prominence of Pulmonary Conus, large Left Pulmonary Artery and Diminished Vascularity of Peripheral Lung Fields. (Reproduced from *Circulation*, 2: 482, 1950, by kind permission of Dr. Duncan Mackintosh, Editor-in-chief, Grune & Stratton, Inc.).

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ventricle. The foramen ovale is usually patent, although this is not always the case.

Clinically, there is cyanosis usually of delayed onset and dyspnœa which is out of proportion to the cyanosis. Examination reveals cardiac enlargement and usually a thrill in the left second interspace with a systolic murmur. The pulmonary second sound is diminished. The liver is usually enlarged and pulsating. The electrocardiogram shows right axis deviation and right ventricular hypertrophy in the limb and præcordial leads respectively. The P waves are high peaked and often there is a partial A-V block and right bundle branch block. The x-ray in the A-P view shows cardiac enlargement to the right and the left (right auricle and right ventricle), a convexity in the region of pulmonary conus, and prominent pulmonary artery shadows at the hilum (Fig. 1). The lung fields, however, are avascular and pulsations are absent.

It is, therefore, clear that a so-called 'blue baby' can be any one of the malformations that have been described.

New Diagnostic Techniques

The two major diagnostic techniques of cardiac catheterisation and angiocardiography are not necessary for every case. By reason of their expensive nature these techniques will be confined to the larger specialist centres for a long time to come. In these centres, however, they are quite justifiably used on every possible case, as it is the only way in which our knowledge of cardiac physiology can be advanced.

Angiocardiography—Introduced by Castellanos in 1937 and developed by Chavez in Mexico and by Robb and Steinburg in the U.S.A., it consists in injecting 70 per cent Diodrast through a large bore needle or cannula into either an arm vein or *via* the jugular vein into the right auricle. There are three ways of obtaining pictures:

1. By cine-camera photography of a fluoroscopic screen.

2. By serial radiography using a rapid changing device viz., frequent and automatic change of casettes.

3. By roll-film radiography using a roll-film camera to photograph a fluorescent screen and taking pictures at a rapid rate viz., one per second. The pictures are magnified afterwards.

By this method the opaque material is seen to fill in sequence the superior vena cava, the right auricle, the right ventricle, the pulmonary artery, the left auricle, the left ventricle and the aorta. Veno-arterial shunts are clearly seen by this method. Thus an overriding aorta is seen by rapid opacification in two or three seconds. When the auricular septum is patent, as in tricuspid atresia, the left auricle is seen to fill in about two seconds.

The methods commonly used in angiocardiography to-day are the second and third in the list above. Although relatively inexpensive, they are very noisy and alarming. The cine-camera appears to be the method of the future, as pictures can be taken much faster. Using this method, Professor Janker of Bonn has developed a technique by which pictures are taken at about 18 per second. In Sweden using an x-ray camera, 15 pictures can be taken per second. Improvements are taking almost daily enabling more frequent exposures to be made. The technique is thus becoming more perfect.

Retrograde Aortography—This is a modification of the above technique. In conditions of coarctation of the aorta for instance, the contrast, if injected in the usual way becomes too diluted by the blood stream to show up the coarcted area and the collaterals. The dye is therefore injected into the aorta direct through a catheter introduced into an artery in a retrograde manner, the artery being usually the radial or the carotid.

Cardiac Catheterisation—Catheterisation of the heart was first performed 21 years ago in 1920 by Forssman on himself. It was, however, in 1941 that Cournand and Ranges first did it in the way we know it to-day. A ureteric catheter, size from 7 to 10 is introduced into an arm vein and is then passed under fluoroscopic control into the superior vena cava, the right auricle, the right ventricle and the pulmonary artery in that order. There are three ways of obtaining data—

1. Information is afforded from the location of the catheter about abnormal communications between the chambers, when these are entered abnormally *e.g.*, in an atrial septal defect, the catheter passes from the right auricle into the left auricle, and then maybe into the pulmonary veins draining the left auricle or even into the left ventricle. In a Fallot's tetralogy it will pass from the right ventricle into the aorta.

2. The pressure in the various chambers is measured as one goes along. The devices for this are varied and ingenious, ranging from a simple saline manometer to a pick-up device incorporated into the tip of the catheter. The most widely used manometer at the present time is a strain-gauge one. In a pulmonary stenosis for instance there is a marked drop in pressure as one passes from the right ventricle into the pulmonary artery. Normally the systolic pressure in the two chambers is the same.

3. The blood in the different chambers is withdrawn under oil and analysed for oxygen content by the method of van Slyke. In some clinics in the U.S.A., viz., the Mayo Clinic, the blood is analysed for oxygen content simultaneously by an oximetric method.

The data obtained by cardiac catheterisation enable one to work out the cardiac output, the systemic and pulmonary blood flows and the direction and amount of shunt when this is present. A new development in recent months has been catheterisation of the left heart by Zimmermann *et al* by a retrograde cathe-

ter introduced into the ulnar artery. The left ventricle was entered in 5 cases of aortic incompetence, but not in normals. This method certainly opens up new possibilities.

Catheterisation and angiocardiography have considerably changed our outlook on the dynamics of the circulation. The two procedures are complementary. Catheterisation may bring to light arteriovenous shunts. indicate the presence and sometimes the exact location of a pulmonary stenosis. It may also give a hint as to whether an operation for the relief of pulmonary stenosis is going to benefit the patient at all. Angiocardiograms on the other hand, give information of a more anatomical nature. The show up veno-arterial communications, the size and presence of pulmonary arteries, and the disposition of the great vessels. As a pre-operative measure the place of these two techniques is now well established. The dangers are not worth mentioning —certainly they are not greater than those of a lumbar puncture.

Other Minor Techniques

Thoracoscopy and Cardioscopy—Visualisation of the heart and great vessels through a thoracoscope and of the heart valves through a cardioscope enables one to confirm a diagnosis before operation is attempted.

Oximetry—This is a very valuable device in the diagnosis of congenital malformations. By means of a photo-electric device applied to the pinna of the ear, the peripheral arterial saturation can be estimated without the bother of an arterial puncture. It is based on the differences in light absorption of oxyhæmoglobin and of reduced hæmoglobin in the visible and infra-red regions of the spectrum. The instrument is by no means perfect at the present time but is being rapidly improved upon. The instrument can also be used for estimating the oxygen saturation of the whole blood during cardiac catheterisation.

Radiokymography—This method records the pulsations of the borders of the heart by means of a multiple-slit grid. In congenital malformations such as patent ductus arteriosus, it may give valuable information.

Surgical Correction of Malformations

The most spectacular development of recent years has been the operation for congenital malformation of the heart. Three types of congenital malformations are at the present time amenable to surgery:

1. Patent ductus arteriosus.
2. Coarctation of the aorta.
3. Pulmonary stenosis.

1. Patent Ductus Arteriosus: First performed by Gross in 1939, it is now done at several centres. When it is an isolated malformation, operation is curative. The consensus of opinion seems to be that if expert surgery is available it should be done in children in whom it is patent after the age of 7 years and in adults if there is some significant symptom as a result of the disease viz., cardiac enlargement. The mortality in Gross's cases was 2 per cent. The ductus can be either ligated or divided.

2. Coarctation of the Aorta: This was first performed by Gross and Hufnagel and by Crafoord and Nylin in 1945. The operation consists of resection of the coarcted area and restoration of continuity of the aorta by end-to-end anastomosis of the two ends of the aorta. Modifications of the procedure are the use of a graft to bridge the gap between two ends of the aorta and the anastomosis of the proximal cut-end of the subclavian artery to the distal end of the aorta. In a recent survey by Gross, the mortality in 100 cases was 11 per cent. Crafoord's mortality in an earlier survey was 16 per cent. 71 per cent showed definite improvement. As the disease carries a low expectation of life (average age 30 years without operation), surgery is advisable provided it is undertaken before atheromatous changes take place in the aorta. The ideal age for operation is 10 to 25 years.

3. Pulmonary Stenosis: Pulmonary stenosis is a feature of several types of congenital heart disease, the great majority cyanotic. Two types of operation are now available for the relief of pulmonary stenosis:

I. The Blalock-Taussig Operation of Subclavian-Pulmonary Anastomosis—This and its modification, the Potts' operation, bypass the obstruction and improve the blood supply to the lungs by the anastomosis of the aorta or one of its branches to the pulmonary artery. This operation has been widely in use for the past 5 years at several clinics in Europe and the U.S.A.

II. Valvulotomy and Infundibular Resection —A direct attack upon the pulmonary valve to relieve obstruction was first performed by Brock in 1948. This method has been chiefly used for the relief of pulmonary stenosis of the valvular type, although lately, by means of a punch, the area of infundibular stenosis has been widened as well. This type of operation is fairly recent and only a few cases have been done up to date, although in these the relief is striking. Out of 33 cases on whom the operation was performed by Brock, 18 had isolated valvular stenosis and 15 had tetralogy of Fallot with valvular stenosis. The mortality in his later series was 18 per cent. The rest had all improved.

Blalock-Taussig Operation

As over 1,000 cases have been subjected to this operation at the Johns Hopkins Hospital, where it was first performed, we can speak of it with some authority. The nature of the operation and its modifications have already been dealt with. Blalock himself prefers to use the subclavian artery opposite to the side on which the aorta arches and anastomose it to the side of the pulmonary artery (end-to-side anastomosis). The innominate or carotid artery can also be used, although this is fraught with more risks of cerebral damage (Fig. 2).

In the Potts operation, the side of the aorta is anastomosed to the pulmonary artery by the use of an ingenious clamp devised by Potts. The Potts operation is more suitable for cases in which for some reason or other it is difficult to mobilise the pulmonary artery.

A variety of congenital malformations, all having one common feature, viz., pulmonary stenosis, have benefited by this operation. Table 1 which represents the result of the first large-scale survey of the results of operation for pulmonary stenosis, gives an idea of some of the malformations amenable to the operation. Table 2 gives the mortality in the various age groups in tetralogy of Fallot.

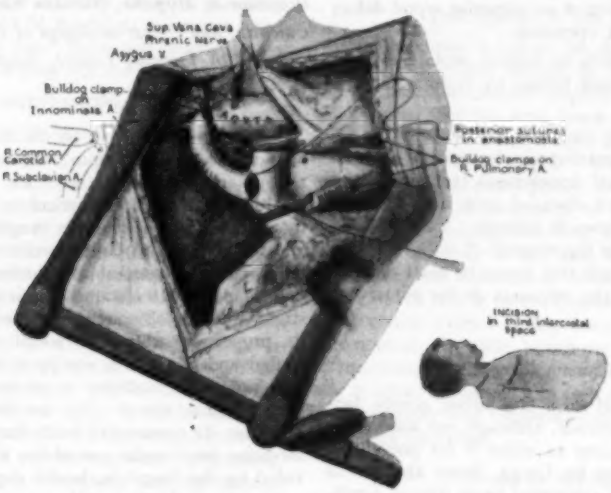

FIG. 2.—THE BLALOCK-TAUSSIG OPERATION. GENERAL VIEW OF THE OPERATIVE FIELD ON THE RIGHT SIDE. THE END OF THE INNOMINATE ARTERY IS BEING ANASTOMOSED TO THE SIDE OF THE RIGHT PULMONARY ARTERY. THE POSTERIOR ROW OF SUTURES IS COMPLETE. THE ANTERIOR ROW HAS NOT BEEN COMPLETED. (Reproduced by kind permission from the *Journal of the American Medical Association*, 128: 189, 1945.)

TABLE 1—SHOWING MALFORMATIONS AMENABLE TO BLALOCK-TAUSSIG OPERATION

Types of Malformations	*Number of Patients*	*Results* GOOD	FAIR	UNIMPROVED	DIED	*Total of mortality six months after operation*
Tetralogy of Fallot	691	82·6%	2%	1·3%	14·2%	15%
Tricuspid Atresia	48	68%	12%	...	16%	24%
Truncus Arteriosus	21	66%	6%	...	28%	28%
Dextrocardia	28	75%	...	...	25%	25%
Situs Inversus & Levocardia	10	80%	10%	...	10%	30%

TABLE 2—SHOWING MORTALITY RATE IN TETRALOGY OF FALLOT IN THE VARIOUS AGE GROUPS

Age Groups	*0-2 yrs.*	*2-5 yrs.*	*5-10 yrs.*	*10-20 yrs.*	*Over 20*
Cases ...	111	213	202	124	30
Mortalty Rate	19%	14%	11%	14%	12%

In cases with a good result (about 84 per cent) the results are indeed striking. The blue baby becomes a striking pink and a child who could hardly walk a few paces before without squatting is able to walk several miles, swim and dance. It is very heartening to see such results, and to see children play and go to school like other children. Without operation a large number of them die young and those who survive are so incapacitated that very few of them lead useful lives and are a burden to their parents.

FUTURE POSSIBILITIES

An increasing number of complicated congenital malformations will come to be recognised with comparative ease clinically, concurrently with the advances made by employing advanced techniques. One cannot but be struck by the number of conditions that have come to be recognised within the past few years.

It would also be quite safe to say that more conditions are liable to become amenable to surgery. Cardiac surgery is becoming as much a speciality as neurosurgery or orthopedic surgery. Contributing to the advances in cardiac surgery are such factors as advances in anæsthesiology, in our knowledge of pre and post-

operative care, of fluid balance and chemotherapy with the newer drugs.

The approach to this problem is largely experimental, and the work done in this field in the U.S.A. is very impressive. A few examples of new surgical procedures are the following:—

I. Another cyanotic malformation, transposition of the great vessels, has been operated upon by Blalock and Hanlon by the creation of an auricular septal defect combined with a Blalock operation.

II. Closure of defects in cardiac septa has been done successfully in human beings by Gordon Murray and others.

III. Experimentally on animals, aortic valvulotomy, atrioventricular anastomosis for mitral obstruction, amputation of atrial appendages, substitution of artificial aortic valves for diseased ones may be forerunners of similar measures in patients. Lastly, rapid strides are being made in the surgery of acquired heart disease viz., mitral stenosis and coronary heart disease. This is bound to speed the advances in the surgery of congenital heart disease.

Prevention

It is well-known that there is a strong genetic factor in congenital heart disease, although our knowledge at this time is not sufficient to utilise it for preventive purposes. The discovery by Gregg, Swan and others that a high incidence of congenital heart disease resulted in offspring of mothers who had been infected with rubella (German measles) in the second and third months of pregnancy, definitely proved that for congenital heart disease to occur, infection should have occurred between the 5th and 8th weeks of fœtal life. Infection in the 3rd month carries a 50-50 risk only. There are some who advocate termination of pregnancy if the mother was infected before the 3rd month. This, however, will not solve the whole problem as it is responsible for only a small percentage of cases (1·6 per cent in one series studied).

I would like to close this paper with a note of optimism. Taussig said that many years ago, while research and study of congenital heart disease was in its infancy, she had encouraged many cyanotic patients with congenital malformations with the hope of something being done for them in the future. Her hopes were amply justified. I think this can be said to be even truer to-day.

Acknowledgment

I am thankful to Dr. Duncan Mackintosh, Editor-in-chief of Grune & Stratton, Inc., for permission to reproduce the figure in page 482 of volume 2 of *Circulation* and to the *Journal of the American Medical Association* for permission to use figure 1 in page 190 of volume 128 of the Journal.

I am greatly indebted to Dr. Helen B. Taussig of the Johns Hopkins Hospital, Baltimore, for her ungrudging help in the above matter.

SPECIAL ARTICLES

PUBLIC HEALTH IN THE MEDICAL CURRICULUM

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Introduction

In a previous paper on the subject "Public Health in the Medical Curriculum" the writer (Bhattacharyya, 1948) had stressed the need for a revision of Public Health in the medical curriculum. It was emphasised that public health shall be taught as a social science and integrated with both pre-clinical and clinical teaching. The provision of a community practice field for developing the technique of social therapy was also stressed. It is obvious that to present public health in its proper orientation as social medicine, a properly staffed and adequately equipped department of preventive and social medicine is an essential requirement in each medical school. Till the time when each school organises its community field, the department of social medicine must make use of the available facilities provided by the hospitals, health departments of the local authorities and other welfare organisations. The development of the teaching of social medicine must be left to the individual teacher as there is much room for experiment in this matter. In the previous paper an outline of the syllabus of public health was presented. In this paper, a detailed syllabus of public health is given. It may be stated here that this syllabus detailed below is a purely tentative one and is intended to teach public health in integration with the clinical and non-clinical subjects of medical curriculum. Emphasis is to be given to the social aspects of the disease by socio-epidemiological studies of the patients and community. The part that social factors play in the total health either of the individual or of the groups has to be impressed upon the students.

Grant (1949) has stressed the relative importance of medical and non-medical measures in the practice of social medicine. It depends, apart from the medical care programme, on the following non-medical measures: (1) social welfare with particular reference to family allowance, training of the disabled, maternity benefit, and home-helps, (2) housing policy based on population needs rather than rental values, (3) a national food policy, (4) provision for mental, social and physical recreation through community centres, and (5) educational measures for the development of health consciousness.

The medical measures would include: (1) removal of economic barriers to health care, (2) provision of

sufficient health personnel properly distributed, and (3) a high degree of technical excellence in both personnel and equipment.

Till the development of these facilities, both medical and non-medical, social therapeutics cannot be properly experimented and applied. It was previously stated that for the development of the techniques of social medicine, a controlled community field is an urgent necessity. In the absence of such facilities, social medicine, can only be taught as a concept rather than as an applied discipline. Socio-pathological studies will, however, help in finding out the total ætiology of diseases.

Comparative Study with other Medical Schools

The teaching of hygiene has been re-oriented in all countries in adjustment to the problems encountered and the facilities available for teaching, demonstration and participation. The British Medical Association, in their report of the Medical Curriculum Committee, "The training of a Doctor, 1948" have recommended a teaching programme which is suitable in the medical schools of U. K. They have divided the subjects into two groups. The first group of subjects will serve as an introduction to the study of social medicine, to the concept of preventive medicine and to the emotional aspect of the diseases. These subjects will be taken up during the transitional period. In the second group of subjects, the teaching will coincide, as nearly as possible, with the appropriate clinical teaching and the instructions will be given during the second clinical year.

In North America the teaching of public health spreads out during the period of 4 years of studies and the statement below shows the distribution of the hours of study in the medical schools of the Universities of (1) Toronto, (2) Vanderbilt and (3) Johns Hopkins.

Comparative Hours of Study in Public Health in North America

	Toronto	*Vanderbilt*	*Johns Hopkins*
1st year:			
Introduction ..	18	—	—
Bio-statistics ...	36	36	60
2nd year:			
Epidemiology ..	36	60	60 (30 exotic diseases)
3rd year:			
Control of communicable diseases (including sanitation and hygiene) ...	44		
4th year:		120	120
Public health administration field visits ...	96		
Total	230	216	270

In U.S.S.R., the teaching of public health occupies an important place and 557 hours of study are given to it (Shemkin, 1947) the lecture periods, however, taking up 273 hours. The statement below shows the distribution of the hours of studies in public health.

Hours of Study in Public Health in U.S.S.R.

Course	*Hours of study*
Hygiene	254
History of medicine	34
Public health organisation ...	85
Infectious diseases and epidemiology	184
	557

Discussion of the Syllabus

In the synopsis below, the distribution of the hours of study of public health in correlation with other clinical and non-clinical subjects has been shown. It will be seen that the total hours provided for the subject is 300. This is not a rigid limitation in the period of study of public health. When facilities will be available for self-participative work in various health centres, it will be necessary to provide for self-participative field training for about a month. The student should be resident in the field area and would work under adequate supervision. Naturally, the teaching of public health has to be readjusted to meet such training opportunities whenever they become available. In the development of public health we are still in the stage of environmental sanitation and it is, therefore, necessary to stress the problem of poor environmental hygiene in our country and comparatively more hours of study have been provided.

Synopsis of the Syllabus

	Course	*Year of study*	*Hours*
I.	Introduction of public health	1st year	8
II.	Medical statistics	1st year	36
III.	Physiological hygiene	2nd year	8
IV.	Health & nutrition—		
	(*a*) Food and nutrition	2nd year	12
	(*b*) Malnutrition and deficiency diseases	3rd year	
V.	Industrial health—		
	(*a*) Industrial hygiene	2nd year	10
	(*b*) Occupational diseases	3rd year	
VI.	Epidemiology and control of communicable diseases	3rd year & 4th year	60
VII.	Environmental hygiene—		
	(*a*) Water		
	(*b*) Disposal of refuse		
	(*c*) Principles of housing		
	(*d*) Disinfection		
	(*e*) Insects & disinfestation		
	(*f*) Fairs & festivals	3rd year	68
VIII.	Mental hygiene	3rd year	6
IX.	Maternal & child welfare	4th year	10
X.	School health	4th year	6
XI.	Health education	4th year	6
XII.	Public health administration including field visits, socio-medical conferences, etc.	4th year & 5th year	70
		Total	300

N.B.—The syllabus in detail is given as an appendix.

The hours of study in each item have not been strictly demarcated into didactic lecture-hours and practical demonstration period. Because of the paucity of suitable teaching demonstration projects, it is left to the judgment of the individual teachers of hygiene as to how to apportion the hours of study into lectures and practical work. But it should be emphasised here that the hours spent on demonstrations, socio-pathological conferences should be, preferably, two-thirds of the total hours of study.

ACKNOWLEDGMENT

I express my thanks to Dr. B. C. Das Gupta, Director of Health Services and Secretary, Medical and Public Health Department, West Bengal, Sri P. M. Dutta, Asstt. Secretary and Dr. S. K. Sarkar, Deputy Director of Health Services for permission to publish the paper. I offer my thanks to Lt.-Col. C. K. Lakshmanan, Director, All-India Institute of Hygiene & Public Health and to Dr. John B. Grant, former Director, for their kind encouragement.

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APPENDIX

SYLLABUS FOR HYGIENE AND PUBLIC HEALTH

I. INTRODUCTION TO PUBLIC HEALTH—(1ST YEAR—8 HOURS)

Aid and Scope of Hygiene—Health promotion, Health protection, Health Restoration and Rehabilitation—Personal Hygiene and Impersonal Hygiene—Historical development of hygiene and public health. Population—Socio-economic factors.

Demonstration of social welfare organisations, social living conditions.

II. MEDICAL STATISTICS—(1ST YEAR—36 HOURS)

Vital Statistics and elementary statistical methods.

Vital Statistics—Population—Census—Registration of Births and Deaths—Notification—Communicable Diseases—Personnel engaged—Local, District and Provincial—Central—International

Statistical methods—Tabulation—Graphs—Spot maps—Average—Rates—Meaning and methods of calculation of birth rate, death rate, Specific death rate, Infant mortality rate, Maternal mortality rate and other mortality and morbidity rates.

Rates—Variation—Statistical constants, Mean, Median, Mode—Normal curve—Trend—Correlation sampling errors—common errors in the collection, analysis and interpretation of data are to be pointed.

Practical—

(1) Inspection of Registrar's Office, Records of Registration of Births, Deaths and Notification of Diseases.

(2) Laboratory work on statistical methods.

III. PHYSIOLOGICAL HYGIENE—(2ND YEAR—8 HOURS)

Physiology and Biochemistry as applied to health problems.

Man—his fitness and the factors which interfere with it.

Measurement of metabolism—Effect of exercise and environment on metabolism.

Work—its nature and methods.

Fatigue—its alleviation.

Physiology of ventilation, temperature and clothing—Necessity for pure air—causes of pollution—how remedied by nature—Diseases produced by impurities Air borne diseases—Simple methods of lighting and ventilating rooms and buildings including schools, factories.

Comfort Zone—Use of Kata Thermometer and other instrument.

Air conditioning.

Practical—

(1) Visit to an industrial plant.

(2) Visit to an air conditioning plant.

(Lectures are to be given in correlation with the course in physiology).

IV. HEALTH AND NUTRITION—(2ND AND 3RD YEARS)—12 HOURS)

(*a*) *Food and Nutrition*

The chemistry of carbohydrate, fats and proteins—their metabolism in the body—requirements and allowances at various stages of life—Foods rich in these constituents.

The minerals—function of Calcium, Iron, trace elements—Deficiency in diet according to standard requirement. Food rich in various minerals.

The Vitamins—importance in diet, requirements—deficiencies in diet. Food rich in various vitamins.

The value of local foodstuffs—cereals, pulses, leafy and non-leafy vegetables, fruits, flesh foods, milk and milk products.

Characteristics of good food and bad food (including fish, vegetables, fruit, meat, poultry, milk and milk products, provisions, etc.).

Food in relation to communicable diseases.

Adulteration of Food—legal provisions and procedures.

Food problem of the country—Problem of production storage and distribution.

Dietetics—Special food for the following—infants, pre-school child, school child, the adolescent, adult man and woman, the manual labourer, the pregnant mother and the nursing mother.

Institutional Dietetics—hospital, boarding houses and camps.

(*b*) *Malnutrition and deficiency diseases*

Malnutrition—causes of malnutrition—effect of malnutrition—its manifestations and detection.

Clinical manifestation of vitamin deficiences—correction of prevention.

Practical—

(1) To conduct a diet survey.

(2) Inspection of food and eating establishments.

(3) Visit model dairy and pasteurisation plant.

(Lectures are to be given in correlation with the course in physiology—Demonstration of cases jointly with Medicine).

V. INDUSTRIAL HEALTH—(2ND AND 3RD YEARS—10 HOURS)

(a) *Industrial Hygiene*

Industrial life—evolution, conditions.

Workers welfare. The factory—conditions, State control.

Industrial fatigue—Genesis, prevention—nature of work, Rhythm and monetory, Rest pauses.

Industrial accidents—factors concerned, compensation, Safety devices.

Industrial legislations in India.

Outlines of an Industrial Hygiene programme.

(b) *Occupational Diseases*

Causation, diagnosis and control.

Trade dusts—generation, effects, reduction.

Trade poisons—production, effects, protection.

Practical—

(1) Visit to an industrial plant.
(2) Visit to an offensive trade.
(3) Visit to an industrial bustee.

(Lectures are to be given in correlation with the course in physiology and demonstration of cases jointly with Medicine).

VI. EPIDEMIOLOGY AND COMMUNICABLE DISEASES—(3RD AND 4TH YEARS—60 HOURS)

Basic understanding of health and diseases—The nature of the latter, its extent and relationship to various factors—heredity, environment, social and economic status, occupation, etc.

Basic concepts of infection and immunity—Nature of infection—Source of infection—modes of transmission—incubation period—quarantine period—carriers, contacts, missed cases. Methods of prevention and control of common communicable diseases—Notification, Investigation, Isolation—Quarantine—surveillance—Disinfection—concurrents, terminal. Epidemic and Endemic Diseases—definition. Methods of Investigation of common infections.

Diseases—Diagnostic laboratory methods—clinical aspects—Social, economic and environmental factors.

Prevention and control of

Small-pox, chicken pox, measles, mumps, whooping cough, diphtheria typhoid, dysentery, cholera, influenza, pneumonia, tuberculosis leprosy, venereal diseases, malaria, filariasis, dengue, glanders, anthrax, etc.

Special Preventive Measures

Vaccination against small-pox, inoculation against typhoid, cholera, plague, diphtheria, whooping cough—yellow fever.

Rat campaign, fly campaign, hook-worm campaign.

Methods of malaria control.

Isolation hospitals—Quarantine camps.

Management of an outbreak of infectious diseases at home.

Lectures on the epidemiology of selected epidemic diseases are to be given in correlation with the courses of bacteriology and parasitology and medicine. Joint clinics are to be held in conjunction with the department of medicine specially in cases of typhoid, cholera, V.D., tuberculosis, etc. Well organised malaria control programme, rural and urban should be demonstrated,

Practical—

(1) Diagnostic and treatment procedures in the Department of Bacteriology and Medicine.
(2) Field work on patient concerning the social and preventive aspects of medicine.
(3) Inspection of malaria control work.

VII. ENVIRONMENTAL HYGIENE—(3RD YEAR)—38 HOURS)

(a) *Water—Physical and Chemical properties of water*

Amount required for various purposes. Sources of supply—various types—Principles of construction and protection of tube wells and wells—Pump—Type, principles.

Methods of collection and storage of water—Prevention of contamination.

Treatment of water—Aeration, sedimentation, coagulation, filtration, softening, iron elimination and disinfection.

Distribution of water—different methods—House connections.

Water supplies in urban and rural areas.

Standards of drinking water—chemical and bacteriological

Practical—

(1) Visit to a rapid filtration plant.
(2) Visit to a slow filtration plant.
(3) Inspect construction of tube well.

(Lectures are to be given in correlation with the course in bacteriology).

(b) *Disposal of Refuse and Excreta*

Definition of terms—Relation between sewage and refuse disposal to spread of disease.

Different types of sewage disposal—urban and rural.

Different types of latrines—bored hole latrines—septic tanks—Bioaeration plants—Disposal of liquid effluent—industrial wastes.

Conservancy—solid wastes—collection and disposal—Trenching, Filling, Incineration, etc. Disposal of dead bodies—cremation burial.

Composting—manure pits.

Surface drainage—different systems—pipes and others.

Fittings—urinals, water closets, manholes, catch pits, syphone, etc

Practical—

(1) Visit to a bioaeration plant.
(2) Visit to a septic tank plant.
(3) Visit to a trenching ground.
(4) Inspect construction of bored hole latrine.

(Lecture are to be given in correlation with the course in bacteriology).

(c) *Principles of Housing—Urban, Rural and Industrial*

General Town planning—zoning of areas, residential, trade, industry, educational, etc. Building—hygienic requirements for buildings—selection of site, soil—area and cubic space recommended for different types—foundation—floor, roof—doors and windows.

Provision of safe water. Disposal of sewage, refuse.

Planning of villages—necessity of reconstruction and remodelling of villages—provision of community plots for obtaining spoil earth, manure pits, pasture land and for play ground—clearance of jungles and elimination of dobas—provision of safe water supply and sanitary disposal of refuse and excreta—roads and drainage.

Buildings—materials for construction of houses, provision of adequate air, light and ventilation.

Practical—

(1) Visit different types of houses under construction in urban and rural areas.

(*d*) *Disinfection*

Disinfectants—deodorants, antiseptics—types of disinfectants—physical, chemical and gaseous. Disinfection of various articles—discharges from patients, soiled linen, etc.—Disinfection of a house.

Practical—

(1) Visit to a plant for steam disinfection.
(2) Concurrent disinfection of a house.
(3) Disinfection or well.
(4) Disinfection of various articles.

(Lectures are to be given in correlation with the course in bacteriology).

(*e*) *Insects and Disinfestation*

Insects and diseases—Their essential characters—life histories in relation to disease—Different methods of propagation of insect-borne diseases. Mosquitoes—anopheles, culex, aedes, Flies—Rat fleas—Lice—Methods of control.

Practical—

(1) Demonstration of caloid fumigation and D.D.T. application.

(Lectures are to be given in correlation with the course in parasitology).

(*f*) *Fairs, Festivals and Camp Sanitation*

Laying out of area—clearing jungles and clearing up buildings—roads—water supply, purification and protection from pollution—Latrines, construction, sufficiency, prevention of soil pollution—Disposal of refuse, storage, dumping, incinerators. Control of food handling establishments—Control of communicable diseases, immunisation, Isolation hospital. Clearing area at end of festival—Legal provision for control.

Practical—

(1) Visit to a mela.

VIII. Mental Hygiene—(3rd year—6 hours)

Mental hygiene for the normal.

The infant—pre-school child, school child.

The habits of children. Puberty and adolescence—The adult.

Sex—occupation. Home—social and gang life.

Problem of old age.

Prevention and amelioration of the results of mental disorder—Heredity and Eugenics—Specific diseases—Trauma—Drug addiction—Industrial intoxicants.

Mental hospital—Readjustment.

Psychiatric social worker and the health department.

Promotion of mental hygiene in the community.

Education—pre-school and child guidance—clinics—public schools. Juvenile courts—Adult criminal courts.

Psychopathic hospital.

Legal responsibility in case of mental diseases—Lunacy acts.

Practical—

(1) Visit to mental hygiene clinics.
(2) Visit to mental hospitals.

(Lectures are to be given in correlation with the course in medicine or psychiatry.

IX. Maternal and Child Health (4th year—10 hours)

Objects of maternity and infant hygiene—Infant mortality, Maternity mortality and morbidity—nature and volume of the problems concerned—(social and economic aspects). Midwifery service. Maternity and Child Welfare Clinics—Health visitor's functions—Clinic work—Home visits.

Problems of the pre-school child.

Practical—

(1) Visit to a maternity and child welfare centre.

(Lectures are to be given in correlation with the course in obstetrics and paediatrics).

X. School Hygiene—(4th year—6 hours)

Essentials of school health programme. Importance of school sanitation—site, buildings, furniture, latrine, urinals, drinking water, disposal of refuse, drainage.

Medical inspection and correction of defects.

Health education procedures.

Practical—

(1) School health survey.

XI. Health Education. (4th year—6 hours)

Basis of modern public health work—to be done through all activities. Different health education procedures—personal contact, lantern talks, cinema, leaflets, journals, press articles, health exhibition and baby show, health clubs. Health museums, radio.

Practical—

(1) Visit to a health museum.
(2) Health talk to a group.

XII. Public Health Administration (4th and 5th years—70 hours)

To acquaint the student with organised forces for the advancement of public health.

History of development of public health in England and other countries, India and Bengal—International Health Organisations—Central, Provincial and Local authorities. Provision of public health services—rural, urban—voluntary organisations.

Elementary discussion of the public health laws applicable to India and Bengal.

Duties and responsibilities of general medical practitioners under the present laws.

Practical—

(1) Working of the local health department in its various departments—urban and rural.
(2) Working of health centres.
(3) Voluntary organisations for social welfare work.
(4) Social—clinical conferences with other departments.
(5) When facilities are available, self-participative field training in health centres for 4 weeks to be arranged in addition to above

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THE SCIENCE OF MICROBIOLOGY

A Plea for a Separate Discipline

S. C. SEAL, M.B.B.S., D.P.H., PH.D., F.A.P.H.A.
All-India Institute of Hygiene and Public Health, Calcutta

Microbiology deals with the field of knowledge of various microscopic and ultramicroscopic forms of life, namely, the viruses, bacteria, filamentous fungi or molds, yeasts, actinomycetes, protozoa, some higher or mushroom fungi, algæ and other microscopic forms of life. It embraces a study of micro-organisms in nature, their historical evolution, their growth, nutrition and physiology, their structure and life cycle, their role in numerous natural processes and their relation to man, to domestic and wild animals and plants and to one another and environment.

This science is of recent origin although the microbes are perhaps the earliest living creatures that came to exist in this world. They have been playing the same role of economy and destruction as have now been found. Even without any knowledge about them they have been utilized by man since time immemorial and even the prehistoric man combated some of the diseases caused by microbes. In fact, it is one of the youngest sciences, being not even a hundred years old, and yet the progress has been almost phenomenal in recent years. In a relatively short time, an important field of science has come into being—a science with applications in virtually every field of human endeavour. Microbes are recognized now as playing very important role in natural processes, e.g., they are the most important causative agents of human, animal and plant diseases, they cause fermentation and thus play an important part in certain industrial processes, as in the preparation of foodstuffs and beverages, food spoilage, deterioration and destruction of all types of materials ranging from textiles to steel pipe, and finally they are recognized as the all important agents in a great number of soil processes. Most recently, however, by the discovery of the antibiotics and their use for combating a wide variety of diseases, for many of which no effective specific drug was previously known, microbiology has attained another peak development in its onward progress and is thus playing a very important role in human economy.

The delay in recognizing this subject as a distinct discipline is partly due to the fact that the two greatest early bacteriologists, Pasteur and Koch, were more concerned with the application of bacteriology, namely, brewery and fermentation problems on the one hand and infectious diseases on the other, than with the organisms causing these, i.e., treating microbiology as a fundamental science, with the result that till very recently the subject of microbiology was treated as a hand-maid of various applied sciences. For instance, in the field of medicine it was closely tied up with pathology, in public health it was associated with sewage disposal and sanitary conditions in general, in agriculture it was concerned mainly with soil processes, composts and the preparation of silage and foodstuffs. Thus the microbes came to be considered as agents either responsible for certain diseases or for some important natural processes.

Since the last two decades, however, this subject has been receiving increasing attention of the scientists, particularly botanists and microbiologists, who have come to the conclusion that microbiology is a field of knowledge in itself. Although a group of bacteriologists consider the disease-producing bacteria as the only microscopic forms of life worth studying, the very large number of saprophytic micro-organisms, which comprise bacteria, fungi and actinomycetes usually dismissed from consideration are now recognised to be groups of bacteria that occupy a unique place in microbiology—because of their great importance as agents of essential life processes, causative agents of human disease, and even as of great economic importance as producers of antibiotic drugs like penicillin which are utilized successfully for combating many of the diseases.

The subject of antibiotics is essentially a great development of World War II. The progress made in this field during the last decade has been so phenomenal that it has almost overshadowed the academic interests in general of bacteria and other microbes, notably the protozoa and the viruses. Although the clinician, the chemist, pharmacologist and physiologist have made their important contributions, all should agree that it is the microbiologist who is entitled to the credit for having opened up this field of science.

Inspite of this recent development no systematic study in general has yet been organised on the subject. Nevertheless, when during the World War II fungi were found to attack optical and electrical equipment, clothing, tents and other materials used by the service personnel and even to infect the human body it naturally required the co-ordinated efforts of many investigators including the microbiologist to study these problems and find their solutions.

Another field of study which has practically remained unexplored is the *actinomycetes* which constitute a large and heterogenous group of micro-organisms. The interest in the study of this group was mainly confined to one or two important plant diseases, to a rare and peculiar human or animal disease infrequently encountered and to the abundant occurrence in the soil but no systematic study was made to determine what these delicate, mycelium-producing, odoriferous microscopic forms of life do either in the soil or in the manure pile. Due to the advent of the new field of study in antibiotics it is now known that 20 per cent or more of all actinomycetes have been found capable of inhibiting the growth of bacteria or other micro-organisms. On account of this finding, the microbiologists and

other investigators have now realized the great potentialities that exist in the study of this microbe and are directing their attention increasingly to the subject.

Micro-organisms are also being increasingly utilized in the study of their role in human nutrition and in the manufacture and assessment of vitamins. There is yet another field of application to which our attention has recently been drawn and it is the potential part that the microbes may play as agents of biological warfare.

Thus having focussed our attention to the large number of applications of micro-organisms and their great importance to our economy, industry, public health and medicine and in view of the great future potentialities for new discoveries in the field, it may be fair to conclude that microbiology is now a field of knowledge by itself and should receive the status of an independent discipline. In recognition of this fact, therefore, a plan should be made for a comprehensive study of the fundamental aspects of the nature and activities of the various groups of micro-organisms, their role in natural processes, their use in agriculture, industry, public health and other aspects of human economy. For this purpose an Institute of Microbiology should be established in India or at least an independent section should be maintained as a separate wing in one of the proposed or already established Central Research Institutes or in the Penicillin Factory, near Poona. Although bacteriology as an important subject has long been recognized in various parts of the world as also by certain Universities in India such as Bombay, Madras, etc. (unfortunately not Calcutta) as post-graduate discipline in medical, veterinary and perhaps agricultural bacteriology, yet its full application is lacking in all countries except perhaps U.S.S.R. An Institute is therefore essential for such studies in India.

Again, there is a large group of bacteriologists medical and non-medical, who are doing an excellent job in the manufacture of anti-sera, vaccines, toxins, antitoxins and other biological products in the various medical industries in India. For them and for the maintenance of the standards of biological products it is imperative that there should be an institute devoted to the studies of applied bacteriology and immunology. The College of Pharmacy in U.S.A. generally provides for such a training. In this respect therefore the section of Microbiology under an Assistant Director (Microbioloy) is a welcome addition to the Central Drug Research Institute, Lucknow.

In certain countries there are associations of bacteriologists and immunologists working independently or in conjunction with that of pathology but an association of microbiologists representing an independent biological system has not been established except perhaps in U.S.S.R. and in the U.S.A. where lately an Institute of Microbiology is in the offing through the efforts of Dr. Waksman, the microbiologist of Nobel Laureate fame. It is, however, a happy augury that the science of microbiology as an independent subject attained international recognition as far back as 1930 and four triennial sessions have already been held. In this connection various countries organised their national groups of association of microbiologists and obtained affiliation to the International Association of Microbiologists as their parent body. India also obtained the necessary affiliation and an organisation has also been in existence since 1938 though virtually inactive till 1947 when it was revived into an active organisation and received fresh affiliation of the international body.

It is high time that this national group as well as a full-fledged association of microbiolgists in India should be organised on a proper and all-India basis so that India can take her rightful place in the comity of nations and in all future deliberations in the International Microbiological Congress. A time may soon come when she should also be in a position to invite this International Association to hold one of its triennial session upon the soils of India. But for this honour and achievement an institute and an association with very large membership are essential prerequisites, as well as a high standard of research work in the field of microbiology.

The third International Microbiological Congress had the following nine sections; namely—

I. General Biology: Variation and Taxonomy.

II. General Biology: Microbiological Chemistry and Physiology.

III. Viruses and Viral Diseases.

IV. Rickettsiæ and Rickettsial diseases.

V. Protozoology and Parasitology.

VI. Fungi and Fungal Diseases (including bacterial diseases of plants).

VII. Medical and Veterinary Bacteriology.

VIII. Agricultural and Industrial Microbiology.

IX. Immunology.

The deliberations in the Third Congress in 1939 were so very successful, though varied, that it is worthwhile to note here the remarks of Dr. T. M. Rivers, President of the Congress at the termination of the session.—

" Indeed, current microbiological work is of such character and the results of it are so impressive that the 'GOLDEN AGE' of bacteriology need not be called upon heavily for support of the contention that Microbiology is a noble and worthy science. Without being boastful one can state that the deeds of modern microbiologists surpass those of the predecessors who laboured during the 'GOLDEN AGE' and this is as it should be."

Considering the above and the present day development of microbiology, particularly in regard to antibiotics, the proposed Institute of Microbiology should have the following sections :

I. General Microbiology: Genetics, Variation and Taxonomy.

II. General Microbiology: Chemistry and Physiology.

III. Fungi and Actinomycetes: Antibiotics of micro-organisms.

IV. Vitamins and Enzymes.

V. Ecology of micro-organisms: Virus, rickettsiæ, bacteria, molds and fungi, actinomycetes, protozoa, helminths, algæ, higher fungi, etc.

VI. Applied Microbiology: Agricultural, soil bacteria, fungi, antinomycetes, nitrifying organisms and saprophytes, microbiology of food stuffs, soil and manure, preservation of food, methods of control.

VII. Industrial: Microbial fermentation, production of alcohol, beverages, vitamins, etc.

VIII. Relation and inter-relation of micro-organisms to human, animal and plant diseases.

IX. Medical and Public Health Microbiology: (*a*) Viruses and viral disease, Rickettsiæ and Rickettsial diseases. (*b*) Fungi and Fungal diseases. (*c*) Protozoology and Parasitology. (*d*) Medical and Public Health Bacteriology. (*e*) Immunology.

X. Veterinary Microbiology: (*a*) Virus and Viral diseases. (*b*) Fungi and Fungal diseases. (*c*) Protozoology and Parasitology. (*d*) Veterinary Bacteriology. (*e*) Immunology.

XI. Preparation and standardisation of sera, vaccines, antisera, toxins, anti-toxins and other biological products for medical and veterinary use.

N.B.—Sections IX and X are highly important fields of Medical and Veterinary Sciences and will generally be left to the Medical, Drug and Veterinary Research Institutes. For fundamental work collaboration with pharmacologists, medical investigators, industrial laboratories and medical institutes should be obtained.

CASE NOTE

SCHILDER'S DISEASE*

AMAL CHAKRAVARTI, M.D. (CAL.),
Burdwan (West Bengal).

Of the demyelinating diseases, Schilder's disease has been considered to be the rarest. The rarity of incidence has been well shown from data collected from the records of patients in the Medical College Hospitals, Calcutta. Out of 1,260 neurological admissions in the 7 year period from 1937-44, there was not a single case of Schilder's disease (Mukherji *et al*, 1949). Further, it appears, that during the last 12 years only 2 cases of Schilder's disease have been reported in India. Of these, one was recorded by Sarma (1944): The patient was a girl aged 3 years. The other case was reported by Mukherji (1949): This was a male patient, aged 16 years. Having consideration of the interesting nature of the malady and the rarity of occurrence, a case of Schilder's disease, seen recently, is reported below:

Case Report

A. K., Hindu, male child, aged 4 years 6 months, was brought for examination on 3-8-51. The complaints, as narrated by the mother of the child were as under: (1) Inability to walk properly following a febrile bout which lasted one day, 10 days ago. The fever was not ushered in with rigor or vomiting. It was neither of a high grade, nor associated with much constitutional disturbance; naturally, therefore, it was considered of no consequence and so the necessity of medical help was not felt. The patient became afebrile on the next day. On the same evening, however, the child was found to tumble down repeatedly, on attempting a walk. Contrary to expectation, the weakness of the legs did not abate with rest but rather went on increasing. He was found to be unable to sit up and later to change position in the bed. He was rather reluctant to move the legs; on questioning, however, he made no complaint regarding his bodily discomforts. All these happened in a week's time. It was at this stage, that the patient was brought for examination.

The antenatal and postnatal history of the child had no relevant point of note. In the family there was no case of acute exanthematous fever or infectious fever in any member, immediately before or within recent past. The child was last vaccinated against small-pox one year ago. He was the second son of his parents. The first child died at the age of 10 from an acute respiratory disorder, diagnosed as pneumonia. The third son was 2 years old and, according to the parents, was quite healthy and without any detectable abnormality.

Examination—Physical growth, apparently proportionate. No developmental anomaly seen. Skull—no detectable abnormality. His sitting time, walking time, age of teething and walking were within normal bounds. He was found to be fairly intelligent, answering questions rationally. He made no complaint except his inability to sit or walk. Disposition cheerful. Pupils—equal, regular, reacting to light. Cranial nerves—no detectable abnormality. Facial muscles on the right were weak, but the palsy was of the supranuclear type. The limbs were maintained in normal tonicity except the left lower limb which was hypotonic. The jerks were normal except in cases of left knee and ankle, which were weak comparatively. There was no wasting of the muscles. Plantar response was flexor in both and superficial abdominal reflex was present in all the quadrants. There was no sensory or sphincter disturbance. Patient was afebrile and examination of other systems was non-contributory in the assessment of the case.

Progress of the case—8-8-51—Condition of the patient considerably worsened. Patient drowsy, apathetic to sur-

* Report of a case demonstrated at School of Tropical Medicine at its XIth clinical meeting.

roundings; reluctant to answer questions. Visual acuity appreciably diminished; narrowed down to just a perception of light; on ophthalmoscopy no evidence of papillœdema or optic atrophy; light reflex persisting. Horizontal nystagmus—seen for the first time in both eyes. Depth of hearing normal. There was no extension of paralytic features. In addition to supranuclear type of facial palsy affecting right-sided facial muscles, there was exaggerated knee and ankle jerks, loss of superficial abdominal reflex and extensor plantar response, all on right side. Further, in addition to inability to sit up or to turn to the sides, he was now unable to hold up the head. The neck was found to be too soft. There was still no sensory or sphincter disturbance. Discrimination between varied grades of stimuli and determination of shape and size of objects, was still possible. Afebrile.

21-8-51—Worsening of the condition still further. Had Jacksonian convulsion affecting the right half of face and right arm on the day before; febrile with a low grade pyrexia since last 7 days. Highly emotional; weeps or smiles, without any provocation. Delirious at times. Fits of visual hallucination present. In between these outbursts patient remains in a drowsy state. Blindness—total in both eyes; pupils widely dilated; light reflex persisting; on ophthalmoscopy no evidence of papillœdema or optic atrophy. There was further extension of paralytic features. In addition to the right, the left knee and ankle jerks as also the right supinator jerk were exaggerated. Superficial abdominal reflex was now absent in all the quadrants and plantar response was extensor on the left also. The neck remained too soft and though the jerks were exaggerated, there was no evidence of any spasticity. There was no sensory or sphincter disturbance, still.

14-9-51—Further deterioration in patient's condition; findings as before. In addition, patellar and ankle clonus present on both sides. Fever persisting. Patient aphasic, blind, stuporose, with intermittent hiccough and Cheyne-Stokes breathing.

15-9-51—The patient died.

Investigations—Blood, urine and stool examinations revealed no significant abnormality. Blood—W.R. was negative. C. S. fluid—clear, 50 drops/min.; cell-count, 15 cells/c.mm.; Protein, 60 mgm. per cent; Kahn test of C. S. fluid negative; culture of C. S. fluid, no growth. Skiagram of skull—no sutural separation; pituitary fossa—normal; no other noticeable abnormality.

Discussion

Encephalitis periaxialis diffusa or Schilder's disease, as it is called, is an acutely progressing demyelination of the brain, commencing at a single or two symmetrical foci and rapidly advancing apparently in terms of functional continuity. Early visual impairment and mental aberrations are its special features. The triad of symptoms in a child deemed clinically characteristic of Schilder's disease has been very ably expressed as—

(*a*) Progressive loss of vision of the cerebral type;

(*b*) Progressive spastic paralysis; and

(*c*) Progressive mental dissolution (Brain and Strauss, 1934).

In a case presenting clinical manifestation of spastic paralysis with blindness, real differentiation lies between neuromyelitis optica and Schilder's disease. The differentiation between the two at times is pretty difficult but points of differentiation are as under:

(1) Whereas neuromyelitis optica affects persons usually of a higher age group, Schilder's disease is essentially a disease of the children below the age of 5, though exceptional variation in case of either, may occur.

(2) In neuromyelitis optica, the clinical picture as the name denotes, is one of spinal involvement, manifesting generally as transverse myelitis with patchy involvement of brain at times. In Schilder's disease, on the other hand, the pathological process, almost in its entirety, is located in the cerebral hemisphere. As a matter of fact, gross involvement of spinal cord almost rules out Schilder's disease.

(3) In neuromyelitis optica, because of myelitis, sensory disturbance and sphincter trouble are to be anticipated. In Schilder's disease, on the other hand, sphincter trouble is unusual and sensory disturbance, when present, is of the higher discriminatory type, because of parietal lobe involvement.

(4) Convulsion and progressive mental deterioration, go very much in favour of Schilder's.

(5) Lastly, blindness may occur in both. But in neuromyelitis optica the blindness is usually accompanied by evidences of either retrobulbar neuritis, papillœdema, optic atrophy or absence of light reflex. In Schilder's disease, on the other hand, though papillœdema may occur in some cases, persistence of light reflex in the blind eye, without any noticeable change in optic disc, is highly characteristic of the condition.

From the aforesaid considerations in the case cited above a diagnosis of Schilder's disease was entertained in preference to neuromyelitis optica. The hypotonicity in general even in presence of unmistakable evidence of upper motor neurone type of palsy, however, remains to be explained. Perhaps it was due to associated cerebellar involvement. Evidence of nystagmus in the case, supports such a contention.

Conclusion

A case of Schilder's disease occurring in a male child, aged 4 years 6 months is reported. The case ended fatally in a little over 6 weeks' time.

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DRUG THERAPY IN HYPERTENSION

Hypertension has always remained a challenging problem from the therapeutic point of view. Diverse measures have been taken from time to time against hypertension but good results have been as elusive as knowledge about its ætiology.

Since the time it came to be known that high blood pressure itself, whatever may be its ætiology, can be responsible for much pathology in the body, attempts to reduce blood pressure to reasonable levels without endangering the blood flow through vital organs like the heart, the brain and the kidneys, seem to be indicated as a rational procedure.

Use of bromides, phenobarbitone or other barbituric acid derivatives, potassium iodide, nitrites and nitrates has long been in vogue. Certainly some benefit has accrued from this. Potassium and sodium sulphocyanate never gained a popularity like these drugs owing to a greater liability to cause toxic manifestations and the need of checking treatment with frequent blood level estimations. On the other hand, in this country, Rauwolfia Serpentina has become a popular remedy and this is more from its harmless nature than for any remarkable hypotensive effect. Its central sedative action may, however, be profitably employed in calming the hyperreacting autonomic nervous system.

Generally speaking, all the drugs mentioned above have not given any uniform satisfaction either to the practising physician or to the hypertensive patient, both from the points of view of symptomatic relief and sustained reduction of blood pressure. Naturally, a dynamic search for other remedies has been in progress throughout the world and has resulted in introduction of several newer drugs in the therapeutic field.

In the first instance, a group of substances blocking the sympathetic tonic vasoconstricting impulses in the sympathetic ganglia or ganglion-blocking agents deserves mention. The quaternary ammonium compounds like tetraethylammonium bromide and polymethylene-bistrimethyl ammonium compounds like hexamethonium compound (C6) and pentamethonium compound (C5) belong to this group. It appears from the current literature that the hexamethonium compound is probably the most favoured drug in clinical use. The use of tetraethylammonium bromide, which has always to be used intravenously, is at present limited owing to its marked parasympathetic blocking effects. Hexamethonium bromide is, on the other hand, a drug of choice for reducing blood pressure. Paton and Zaimis[1] introduced the drug in the therapy of hypertension. Considerable literature on this drug has already been reviewed [2, 3].

The drug can be administered both by the oral and parenteral routes. The parenteral route is to be preferred in cases of acute hypertensive crises or in chronic cases where absorption of the ingested drug seems to be unsatisfactory. Although generally found to be a useful remedy, it has its limitations. Patients are apt to develop tolerance for the drug and gradually increasing doses are required to be administered.

Effects of the drug on blood pressure are not uniform and there are many instances of failure. Side effects like lightheadedness, drowsiness, visual disturbances, constipation, diarrhœa, may be troublesome in some cases and vomiting, emotional lability, cyanosis of extremities, riboflavine-deficiency, dysmenorrhœa and insomnia in others[4].

Except in acute hypertensive crises or in malignant hypertension or eclamptic hypertension, treatment by two or three injections daily apparently would seem to be rather a rigorous procedure.

A second important addition to drug therapy in hypertension has been possible by revival of interest in veratrum viride since Freis and Stanton[5] wrote on this subject. Stutzman *et al*[6] produced by fractionation a stable, reproducible and potent mixture of ester alkaloids called 'veriloid' which could be standardised by bioassay on dogs by hypotensive effects. Certain of the alkaloids have been isolated in pure form: germitine and germidine[7]. An alkaloid called protoveratrine has been isolated from veratrum album. All these alkaloids are believed to act by exerting a reflex depressor action through afferent vagal fibres from the heart (von Bezold reflex) and the lungs. Maison as pointed out by Ralph Kauntze[8] believes that this hypotensive effect caused by veratrum is mainly of central origin. Ralph Kauntze has ably summed up the present position of veratrum and recorded his own relevant observations. It appears, however, that toxic manifestations from the use of veratrum are sufficiently frequent to be taken into account while resorting to this therapy. Emptiness behind sternum, burning pains in that region, salivation, choking, hiccough, nausea, recurrent vomiting, coldness of extremities and collapse have been recorded. The overall results have been excellent at times but as this observer points out, the progress of the disease is not halted. Only the tempo is slowed.

A third group of drugs has recently come into use: the dihydrogenated alkaloids of ergot—dihydroergo-

[1] *Nature*, **162**: 810, 1948.

[2] Paton—*Brit. M. Bull.*, **8**: 310, 1952.

[3] Rosenheim—*Proc. Roy. Soc. Med.*, **45**: 269, 1952.

[4] Murphy—*Lancet*, **2**: 899, 1951.

[5] Freis and Stanton—*Am. Heart J.*, **36**: 723, 1948.

[6] Stutzman *et al*—*Proc. Soc. Exper. Biol. & Med.*, **71**: 725, 1949.

[7] Freis *et al*—*J. Pharmacol.*, **98**: 166, 1950.

[8] Ralph Kauntze—*Proc. Roy. Soc. Med.*, **45**: 271, 1952.

cornine, dihydroergokryptine and dihydroergocrystine. These drugs act on the sympathetic myoneural junctions in the vessel wall. Their action is sympathicolytic and adrenolytic, in addition to some central sedative actions. The subject has been reviewed by Goetz[9].

A fourth group of drugs includes Benzodioxane (933 F and 1164 F and dibenamine (dibenzylbetachloroethylamine hydrochloride) which are of value only by virtue of their adrenolytic properties. These drugs are only useful in cases of phaeochromocytomata which are rarely met with in clinical practice.

Time has not yet come to pass a verdict on these various drugs. They are certainly useful additions to our armamentarium but they are not the answers to hypertension. They are not the agents we have been looking for eagerly. In regard to their efficacy, they have their limitations. Untoward side effects cannot be ignored.

No wonder then that surgical intervention has been thought of, in the management of hypertension. Smithwick's thoracoclumbar sympathicectomy and allied operations are already recognised to be useful measures. However, the initial hopes raised by the surgical operations have been hardly realised. Surgical treatment is applicable to less than 10 per cent of all hypertensives[10]. There may be relapse of hypertension after the operation. Except in malignant hypertension, sympathicectomy again is not the answer to the problem.

Hypertension was challenging in the past. It still remains a challenging problem from many points of view.

OUR CONFERENCE

On the 26th of this month the members of the medical profession of this country will meet at Patna on the occasion of the 29th Annual All-India Medical Conference. Dr. B. V. Mulay of Sholapur will preside over the Conference. Anybody who attended the All-India Medical Conference at Sholapur in 1950 will remember with pleasure, the excellent arrangements and the planned and disciplined work under the chairmanship of Dr. Mulay. The members of the association who assemble at Patna can naturally expect that Dr. Mulay will conduct the ensuing Conference and the work of the association during the coming year with firmness and impartiality so characteristic of him.

Patna had the privilege of holding the 19th session of the All-India Medical Conference in April 1943 under the presidentship of Dr. R. A. Amesur (then of Karachi). The first important resolution passed at that Conference was as follows:

"That this Conference is of opinion that as each individual in this country has the right to obtain every type of medical service, preventive and curative, general and specialist, domiciliary and institutional, the State as well as various political parties in the country should devise ways and means to secure the same for him at an early date. This Conference also urges upon the Indian Medical Association, which must play an essential part in the preparation of what is the most important charter of health ever conceived for this nation, to render every assistance in their power towards the evolution and fruition of such a scheme".

The Association continues to hold the same view but the problem is how to do it?

To attain this object it is obvious that the Government of India and the State Governments must take into confidence the representatives of the national medical association to devise the methods of achieving the common goal and take stock of the progress from time to time for the development of our health scheme. Though this country has attained independence only five years back the major factors of poverty, ignorance, etc., are still rampant. The members of the medical profession of India should wholeheartedly co-operate with the national Government and not doubt their sincerity of purpose though there might be disagreements.

This is the time and occasion when the association should bring home to the national Government their deficiencies and defects, if any. Likewise, it should also be the duty of the Government to review the whole situation in a true perspective and reorient things on their merit.

It is argued how the I.M.A. can claim to represent the medical profession of the whole country with only 25 to 30 per cent of the members of the medical profession in its roll. Instead of raising this question which is a weak point in our association, may we ask a counter-question as a pointer? Less than 10 per cent of the people of India are members of the Indian National Congress and the Congress has formed the Central Government of India and most of the State Governments in this country. Can anybody question the representative character of the Congress? The majority of the people do not take active interest in the politics of this country. Similarly, the majority of the members of the medical profession do not take active interest in the affairs of the profession as a whole. This is unfortunate but this is bare truth. Such a peculiar condition has arisen because this country was in subjugation for about two hundred years and the members of the medical profession had no opportunity whatsoever to be interested in the health policy of the medical administration of this vast country. Things have changed during recent years. The association expects that within the next few years the majority of the members of the medical profession would take much more active interest in the affairs of the association and the country.

[9] GOETZ—*Angiology*, 2: 1, 1951.
[10] PAUL WHITE—Heart Disease, 1951.

CURRENT MEDICAL LITERATURE

Acute Anicteric Virus Hepatitis

Denber and Leibowitz (*J. A. M. A.*, **149**: 546, 1952) in reporting on the clinical and laboratory findings in 30 sporadic cases of acute anicteric virus hepatitis observe that an awareness of the possible existence of this disease is probably the most important factor in diagnosis. The most frequently encountered symptoms were fatigue, anorexia, distaste for smoking, abdominal pains, headache, and nausea. Less commonly encountered were soreness of the throat, chills, diarrhœa, vomiting, and cough.

Tenderness over the liver area was elicited in 19 per cent of the patients. The liver was palpably enlarged in 56 per cent. The liver was neither palpable nor tender in 16 per cent. The spleen was palpable in 27 per cent of the cases, approximately half as frequently as was the liver. The spleen was considered tender infrequently (6 per cent). Lymph nodes, mainly of the posterior cervical chain, were enlarged in 56 per cent of the cases. In approximately half of these generalized lymphadenopathy was observed (inguinal, axillary, and epitrochlear).

Thymol turbidity was positive in all patients; cephalin-cholesterol flocculation was positive in 86 per cent of the patients.

All patients in this series recovered completely within a period of four months with the exception of one, who showed evidence of chronic active hepatitis one year after the onset of her illness. The occupational and epidemiological hazards of this disease are emphasized.

Nutritional Heart Disease

Gillenders (*Brit. Heart J.*, **13**: 177, 1951) describes a form of heart disease thought to be due to malnutrition and invariably associated with progressive liver disease known to be caused by malnutrition. His series consists of 30 cases, 22 men and 8 women, aged 30 to 63 years.

The diet was composed of white bread, tea, sugar and porridge made from maize. The duration of symptoms was brief. Dyspnœa was present in all but three. Twelve had a dry cough and 16 pain in the right upper quadrant. Generalized massive œdema spreading from below upward and engorgement of the neck veins were present. Liver enlargement was present in all.

The heart was enlarged in all. There was a feeble apical impulse and pulsations, as seen fluoroscopically, were minimal. Sinus rhythm and a diastolic gallop were present. The most constant electrocardiographic abnormality seen in 12 of 20 tracings was a pattern of subepicardial injury.

Digitalis, digitalis and mercurials, aneurin, Brewers' yeast, alpha-tocopherol and testosterone propionate were ineffective. A well balanced diet within two to three weeks produced complete recovery in 13 and 8 died. The hearts show hypertrophy of the walls of both ventricles and microscopicall interfibrillary œdema of the myocardium.

Left Atrial Enlargement

Jacobson and others (*Am. Heart J.*, **43**: 423, 1952) write that in forty-nine patients with rheumatic and one with arteriosclerotic heart disease, the left lateral upright view of the chest with the œsophagus opacified by barium has been found markedly superior to the right anterior oblique view in demonstrating left atrial enlargement. The authors feel that the left lateral view is the position of choice for evaluating left atrial size.

Coronary Artery Disease

Briggs (*J. A. M. A.*, **149**: 345, 1952) writes:

Angina pectoris may be manifested as almost any kind of pain and results from a disproportion between the oxygen requirement and the oxygen supply to the heart muscle. It may be the result to some disease within the heart or the coronary arteries, of the inability of the blood to carry oxygen to the heart, of some disturbance in the minute volume output of the heart such as found in valvular heart disease, of a fall in the mean aortic blood pressure as seen in paroxysmal tachycardia and aortic insufficiency, or of a disproportion between the muscle bulk of the heart and the blood vessels supplying the muscle. The pain or distress is variable and may mimic other forms of chest pain or chest diseases. It has, however, the following pattern that is the common denominator for making the diagnosis, namely, that the pain follows or is associated with physical exertion or emotional excitement and that it is relieved by rest and glyceryl trinitrate (nitroglycerin). In the patients with angina pectoris the diagnosis must be made entirely by history. There are no pathognomonic signs nor pathognomonic laboratory tests to establish the diagnosis. In some of these patients a coronary thrombosis will develop with or without myocardial infarction, or an infarction may develop alone. When this occurs, the patient must be kept in bed. He must receive morphine sulfate in adequate doses and oxygen if needed. He must be placed on a bland diet. Anticoagulants are used if necessary, so that the prothrombin activity is about 20 to 30 per cent of normal. He is digitalized, and mercurial diuretics are used as needed. The patient remains at rest until all signs and symptoms of the infarction disappear. He then does graduated exercises and returns to his activities. Should he have anginal pain, limitation of his activities is governed by the pain. He may do any thing he wishes that does not produce the pain. He is taught to use glyceryl trinitrite dissolved under tongue, 1/200 grain (0.3 mgm.) when required to relieve the pain and to use it prophylactically, if necessary, when he knows the coming events will precipitate an attack of pain. Those persons who have paroxysmal nocturnal dyspnœa, which is a variant of angina, may be treated by using prophylactically one of the mercurial diuretics once or twice a week injecting 1 or 2 cc. intramuscularly. In the patient who has postprandial pain we find that the addition of phenobarbital sodium, ½ grain (30 mgm.), plus atropine sulfate, 1/150 grain (0.4 mgm.), to sodium bicarbonate (Sippy powder) taken three times a day after meals will often relieve the attacks of pain. Finally, it is important in this disease to pay more attention to what you hear from the patient than what you hear through a stethoscope and more attention to what you see in the patient than to what you see in an electrocardiogram.—*Author's Summary.*

Syphilitic Heart Disease in the Aged

Zeman and Storch (*Ann. Int. Med.*, **36**: 1423, 1952) write that survey of the literature discloses the significant incidence of syphilitic heart disease among elderly individuals. This study of 36 cases, 60 years of age and over, of which 14 came to autopsy emphasizes the distinctive features of the pathologic and clinical pictures. Cardiovascu-

lar syphilis in the higher age groups may be associated with congenital, hypertensive, arteriosclerotic and rheumatic heart disease. Two previously reported cases of subacute bacterial endocarditis engrafted upon syphilitic disease of the aortic valves are included in this series. Factors favouring diagnostic error are lack of awareness on the part of the physician, especially in the presence of negative serum reactions, and the obscuring of the clinical pictures by heart failure and superimposed acute infections.

Special attention is called to six cases of combined syphilitic and rheumatic heart disease, of which two showed the association of syphilitic aortic insufficiency and aortic stenosis, presumably rheumatic in origin, previously considered on theoretic grounds to be an impossible combination. The differential diagnosis between syphilitic and arteriosclerotic aneurysms is discussed, as well as the relation of syphilis to coronary heart disease. Particular attention is drawn to the observation that auricular fibrillation, however rare among younger patients with cardiovascular syphilis, was observed in seven out of the 36 cases in this study.

The correct diagnosis will be arrived at more frequently in older individuals if the physician regularly considers syphilis as a diagnostic possibility in every case of heart disease, and proceeds after a careful history and thorough examination to have the heart and aorta examined roentgenologically and to test the blood serologically—routine proceedings in younger patients but too often neglected in the aged.

Green Sputum

Robertson (*Lancet*, 1: 12, 1952) tried to find out why sputum became green and the relationship of such sputum to bronchiectasis by collecting some 50 samples of green sputum from patients with bronchiectasis or pulmonary abscess. After much trial and error the method adopted was to centrifuge the sputum, preferably after allowing it to stand for some time, and then to emulsify the greenish upper layer with chloroform, and again centrifuge for a long time. In this way it was possible to get a green solution that was clear enough for spectrophotometry. The absorption curves in the spectrum were those of verdoperoxidase, and the author suggests that green sputum is purulent sputum in which there is failure to excrete verdoperoxidase which accumulates and colors the sputum green. This happens whenever there is stagnation, especially in disease of the bronchial wall. Two clinical examples may be given: (1) during the night the patient may not cough much, and by morning his sputum may be green, but once this has been expectorated the purulent material may revert to its normal color unless there is continued difficulty with expectoration; and (2) in a lung abscess there is destruction of leukocytes with failure to excrete any enzyme, and a green color may be found when the abscess is coughed up.

Drugs and Emotions on Blood Coagulation

Macht (*J. A. M. A.*, 148: 265, 1952) writes that animal experiments and clinical studies reveal that a number of drugs widely employed in medical and surgical practice exert a thromboplastic or coagulation promoting influence on the blood of animals and human beings. Among the most important of these are the digitaloid drugs and the antibiotics —penicillin, streptomycin and aureomycin. Other such drugs are the well-known and useful mercurial diuretics, the metallic antisyphilitics, amphetamine, and some opium derivatives. Although there is usually a wide margin of safety for accommodating fluctuations in coagulation time of the blood, the previously described thrompoplastic properties of our most useful medicaments should be borne in mind and prevented from exerting deleterious effects by the administration of suitable anticoagulant agents. Of no less importance is the discovery that even in healthy persons, both male and female, acute apprehension, fear, and intense worry markedly accelerate blood coagulation and therefore call for suitable psychological as well as pharmacological therapy.

Agranulocytosis After Mercurial Diuretics

Silverman and Worthen (*J. A. M. A.*, 148: 200, 1952) report that an unusual depression of the white blood cells is reported in a patient under treatment for congestive circulatory failure with mercurial diuretics. Mersalyl and theophylline injection (solution salyrgan-theophylline) and meralluride injection (mercuhydrin) were believed to be responsible for this reaction, which was not observed following the use of mercaptomerin (thiomerin) sodium. At the height of the disorder, the peripheral blood was characterized by severe neutropenia and the bone marrow by a maturation arrest of the granulocyte series at the myelocyte stage. The authors maintain that the mercurial diuretics should be added to the list of drugs capable of producing agranulocytosis.

Anaphylactic Shock following I. V. Vitamin B Complex

Chitwood and Moore (*J. A. M. A.*), 148: 461, 1952) report a case of circulatory collapse following the intravenous administration of vitamin B complex. Several facts illustrated by this case are listed. These are: First, vitamin preparations should be given orally when that route is feasible. Second, in the few selected cases in which intravenous administration of vitamins is necessary, it should be done slowly, and probably the preparation should be diluted to avoid speed reactions. Third, any patient who is to receive vitamins parenterally should be questioned closely about any symptoms following previous injections. In this way a sensitivity may be found and thus a severe reaction may be prevented. Pelner has suggested that a skin sensitivity test be made prior to parenteral administration of nicotinic acid. Weigand has advised this also in his report of 179 cases of sensitivity to thiamine hydrochloride. Fourth, epinephrine should be at hand, preferably in a syringe, when parenteral administration of vitamins is contemplated. Finally, the circulatory collapse that occurred here caused definite coronary insufficiency, as evidenced by electrocardiographic changes. This possibility should be kept in mind, especially in older patients with arteriosclerosis, as myocardial infarction could easily ensue.

Purpura from Digitoxin

Berger (*J. A. M. A.*, 148: 282, 1952) writes that thrombopenic purpura developed in a patient with rheumatic heart disease while she was receiving various cardiac drugs, including digitoxin, mercurial diuretics, and sedatives. Subsequent experience disclosed that digitoxin was the offending medicament when it was inadvertently given to her without changing any of the other drugs she was receiving. Later the administration of other drugs given prior to the development of the purpuric state failed to initiate any evidence of the blood dyscrasia. Finally, when small doses of digitoxin were given again, the daily blood cell counts showed a decrease in platelets on the sixth day. It is concluded that digitoxin is capable, albeit very rarely, of producing thrombopenic purpura.

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Lying on the Abdomen as a Therapeutic Measure

Stahl (*Munchen. med. Wochenschr.*, **93**: 1733, 1951, *Ref. J. A. M. A.*, **147**: 1716, 1952) writes that in 1923, Rautenberg used the prone position in pulmonary disorders with beginning liquefaction of exudate and deficient expectoration and described the results as life-saving. Stahl observed patients with tuberculosis of the vertebral column at Rollier's clinic in Leysin who were kept lying on the abdomen from 8 to 12 hours a day. Percussion of patients with different types of physiques revealed that in the supine position the lower limits of the lung differ little from those found in the sitting posture but that in the prone position the limits are lower in all types of physiques. Roentgenograms reveal that during both inspiration and expiration the postdiaphragmatic sinus is wider and lower in the prone than in the supine posture. The maximal opening of the posterior diaphragmatic sinus facilitates better ventilation and blood perfusion in the lower lobe of the lung. The abdominal posture can be tried in most patients except when wounds, suppurations, or arthritis make it impossible or when severe cardiac insufficiency, dyspnea, or a tendency to apoplexy contraindicate it. The musculature is strengthened, and, in addition, the metabolism is stimulated and the complications resulting from prolonged lying on the back are prevented. The position may have prophylactic value in pneumonia. Even unconscious patients can be put in this position, since it facilitates evacuation of fluids from nose and mouth. The prone position, preferably combined with occupational therapy, can be employed for group treatment in hospital wards by letting patients assume this position twice a day for from 10 minutes up to an hour. The author recommends the use of a flat mattress. A wedge-shaped cushion is placed under the chest, so that the patient can lean his elbows over it; the head is held up and is not to be supported. In some patients a ring-shaped cushion may be placed under the abdomen. A wedge-shaped cushion under the shins prevents an excess load on the toes. The patients can read, write, and do handicraft work in this position, in fact they should be urged to work to do something while they are in this position, because with suitable diversion, they will maintain it longer. Furthermore, activity in this posture will strengthen the musculature of neck, shoulders, arms, and back.

Quinacrine in Taeniasis

Sodeman and Jung (*J. A. M. A.*, **148**: 285, 1952) write that in a series of 11 patients with Tænia saginata infestation treated with quinacrine hydrochloride (atabrine dihydrochloride), the drug was effective in 10 on initial trial and in the 11th patient when treatment was repeated. The only toxic reactions of importance were nausea and vomiting, which, in general, were easily controlled. Quinacrine appears to be the drug of choice in the treatment of Tænia saginata infestation. The following is the regime of treatment adopted: On the morning of treatment a cleansing saline enema is given. An hour after enema the patient is given 0·6 to 1·2 gm. of quinacrine hydrochloride, the dose being adjusted according to the age and size of the patient. Because of the nausea often produced by the drug 0·8 gm. is used as the upper limit. Two of 0·1 gm. tablets are given every 5 minutes with a little water until the entire dose is given. Three to four hours after a purgative is given though the latter is unnecessary in some cases, the drug itself causing sufficient purgation.

Chloroquine for Pulmonary Amœbic Abscess

Lindsay and others (*Dis. Chest*, **20**: 533, 1952, *J. A. M. A.*, **148**: 674, 1952) report a case of a man, aged 54, who had been in good health until about four months prior to hospitalization for a prolonged pulmonary infection. During the first three weeks in the hospital he was asymptomatic except for a cough productive of about one oz. (30 c.c.) of green purulent sputum daily. Bronchoscopy revealed no evidence of bronchogenic carcinoma, and the bronchial secretions aspirated contained neither tumour cells nor acidfast bacilli. Subsequently his temperature spiked to 102°·4 F., malaise and anorexia became marked, and the liver became larger and tender. The white blood cell count rose, and the sputum became rusty brown. The following day motile trophozoites of *Ent. histolytica* were found in the sputum. Examination of the fæces revealed no amœbæ. Emetine, 1 grain (60 mgm.) daily for 10 days, but at the end of this time there was no appreciable change. The sputum remained positive for trophozoites, and the chest roentgenogram was unchanged. Chloroquine was started in doses of 1 gm. daily for two days followed by 0·5 gm. daily for 18 days. Procaine penicillin, 600,000 units daily, was also given to control possible secondary infection. One week after the institution of chloroquine therapy, cough was minimal and the sputum no longer rusty. After 10 days of chloroquine therapy, amœbæ disappeared from the sputum, and there was demonstrable roentgenographic improvement. It is suggested that the pulmonary amœbic abscess resulted from hæmatogenous spread of amœbic parasites from liver to lung. Since emetine alone failed to cause a satisfactory response, and chloroquine induced complete clinical remission, it is felt that chloroquine is a useful agent in pleuropulmonary amœbiasis.

Proper Use of Iron, Liver Extract, Vitamin B_{12} and Folic Acid in Anæmias

Heck (*J. A. M. A.*, **148**: 783, 1952) gives in the following lines the summary of his observations: Except possibly in some very unusual situation the treatment of anæmia resolves itself into the use of specific substances depending on the morphologic blood picture. In hypochromic anæmias, which are usually due to loss of blood, the proper treatment is the oral use of a preparation of iron. For these anæmias, liver extract, vitamin B_{12}, folic acid, desiccated hog stomach, and stomach-liver or iron-stomach-liver preparations serve no useful purpose and are definitely not indicated. In those unusual instances in which iron taken by mouth cannot be tolerated or produces an increase in gastro-intestinal symptoms, it can be given intravenously.

The commonest diagnosis of macrocytic anæmias with megaloblastic type of bone marrow in northern United States is pernicious anæmia. The most desirable form of treatment of this type of anæmia is the parenteral use of a potent liver extract or the parenteral use of vitamin B_{12}. Preparations of liver or stomach or liver-stomach combinations for oral administration can be used and are effective when given in adequate amounts. The presence of neurologic manifestations with pernicious anæmia requires that much larger quantities of potent material be used either parenterally or orally. Iron is not indicated unless loss of blood is associated with pernicious anæmia. Folic acid, while not contraindicated, is not necessary in the complete treatment of pernicious anæmia and, when used alone, constitutes inadequate treatment.

Concerning other diseases associated with megaloblastic anæmia, there are differences of opinion regarding the response to vitamin B_{12} and folic acid. Some patients will respond only partially or not at all to vitamin B_{12}, and subsequently a good result can be obtained with folic acid. Many of the anæmias in this group have to be treated on a trial and error basis, since with our present knowledge we have no way of knowing which material is going to be effective.

None of the substances discussed in this paper are of value in the treatment of the anæmia associated with (1) various types of malignant lesions, particularly those with metastasis to the bone marrow, (2) diseases of the reticulo-endothelial system, such as the various leukæmias and aplastic anæmia, and (3) diseases in which there is toxæmia or interference with metabolism of hæmoglobin, such as is seen in chronic glomerulonephritis with azotæmia or in infections. In rheumatoid arthritis oral administration of iron is of no benefit, and the experience with iron given intravenously is as yet too limited to permit a satisfactory opinion.

Treatment with iron, liver extract, vitamin B_{12}, or folic acid is of benefit only when these substances are deficient, and none of these forms of medication is helpful in anæmia due to some cause other than that produced by these specific deficiencies. A useful maxim then is: Determine the type of anæmia present, give only the medicament indicated; do not mix the treatment.

Rehabilitation for Hemiplegics in the Home

Rudolph (*Physical Therapy Rev.*, 32: 113, 1952) writes:

Most patients prefer to be at home in their natural environment with the comfort of their own beds and the freedom of their own households. They can be spared contact with the misfortunes of others and are relieved of the anxiety of mounting expense during total loss of earning power. The interested family physician can serve as his own rehabilitation co-ordinator if he will take the time to learn the simpler technics in rehabilitation and familiarize himself with facilities in his own community.

A simplified programme for the rehabilitation of hemiplegics in the home is presented as a more practicable approach to the problem of adequate care.

Proper postural alignment can be started at once in all hemiplegics regardless of the pathology. An ordinary bed cannot be replaced by a hospital bed, because getting out of bed is best accomplished when the feet can be placed firmly on the floor while sitting on the edge of the bed. A bed board beneath the mattress prevents sag whether the patient is lying flat or sitting on the edge of the bed. A shoulder abduction pillow between chest and arm, placing the shoulder in about 45° abduction and 15° external rotation, assists in preventing the frequently observed painful and stiff arthropathies. A footboard, preferably a box, can serve to prevent a tight heel cord and foot drop. A heavy cloth bag, shaped like a large bologna, filled with sand or yard dirt, placed on the outer side of the foot and leg will prevent tibial torsion and external rotation of the lower extremity. A hand roll made by rolling a pair of men's socks or stuffing a piece of stockinette with cotton, and equipped with snug tape top and bottom for insertion of thumb and fingers, can serve to maintain functional position of the hand. A five cent pulley fastened to the head end of the bed on the side of the involved arm, and supplied with a length of washline, will afford passive exercise of the involved extremity, with the good hand applying traction. Customarily we prefer to recommend passive motion of the involved extremity by the patient who can be taught to use his good hand. This serves the additional purpose of maintaining strength in the good arm. A knotted rope fastened to the foot end of the bed either as a single strand or in the form of a rein has been recommended for reconditioning flexors of the trunk and to permit the patient to get into a sitting position.

Ideally an evaluation of this disability is in order, with a muscle test, range of joint motion, and a functioonal evaluation.

Heat in the form of electric pads, hot water bottles, hot packs and bulb lamps may prove of value in alleviating the joint pain and muscle spasticity in the neglected hemiplegics. Massage may be of value in the presence of œdema and flaccidity. We have had occasion to use these modalities only in rare instances.

Movement by exercise is the prime factor in a rehabilitation programme for all hemiplegics. In the totally paralysed extremity passive motion is essential to prevent painful contractures and deformities. Active exercises can be prescribed in accordance with strength of the fundamental movements of a joint. Experience has demonstrated that co-operation with an exercise programme is inversely proportional to the number of exercises and their complexity. The following list of extremely simple exercises is contained in our instruction sheet distributed to all hemiplegics:

Arm Exercises:

1. Raise arm forward to head of bed. 2. Raise arm sidewards to head of bed. 3. Press arm downwards on bed. 4. Place bent elbow on level with shoulder; roll arm so that back of hand touches bed; roll back so that palm touches bed. 5. Bend elbow. Straighten elbow. 6. Arm at side, roll wrist out, roll it in. 7. Palm on bed, raise hand. 8. Back of hand on bed, raise hand. 9. Make a fist straighten fingers. 10. Fingers straight, separate them and bring them together. 11. Touch thumb to all fingertips.

Leg Exercises:

1. Bend hip, raising knee onto abdomen. 2. Legs together, take leg out sidewards and bring it back. 3. Raise straight leg in air. 4. Slide heel on bed, bending knee. 5. Bend foot up, down, in, out and around. 6. Curl toes, and straighten. 7. Turn on abdomen, raise straight leg 8. Bend knee.

Just as soon as the condition warrants, practice in balance should be instituted first by having the patient sit on the edge of the bed and gradually come to a standing position. Once the patient is out of bed, the family is advised to dress him fully with particular emphasis on shoes rather than slippers. The occasional dependent œdema can be controlled without difficulty with an elastic bandage.

Not infrequently a rotating hip, a buckling knee, and a flail or dropped ankle will require a brace. There comes a time in the progress of most patients when the musculature of the hip and knee can stabilize the extremity sufficiently to require only a low leg brace to support the ankle. This may require several weeks or months during which time the patient is mostly recumbent awaiting the increased strength of the hip and knee. It has been our practice to supply a hemiplegic at the earliest possible moment with a long leg brace and pelvic band. More often than not this is done within the

first month. The status of the involved leg is ignored completely provided the patient is able to stand on the good leg and can support himself in the standing position with the good arm and hand. It is our impression that the standing position with a very weak but well braced leg elicits a bombardment of proprioceptive impulses, which must be the determining factor in producing rapid strengthening of muscles. It must be remembered that the hemiplegic has one good hand only and since the goal in rehabilitation is independence, the brace should be constructed to afford ease of handling. Leather cuffs and both shoes can be provided with overshoe buckles which can be snapped into position with one hand with a surprising degree of ease.

Occupational therapy, particularly valuable in retraining of the hand, is still largely an institutional procedure. However, a little attention to the pursuit of hobbies and simple handicraft activities at home can assist greatly in the rehabilitation of the hand. We have found nothing so far which is superior to the handling of cards in solitaire for retraining in co-ordination. The use of picture puzzles and checkers serve the same purpose. Speech therapy for the aphasic need not be an insurmountable problem. Most communities with progressive school administrations employ one or more speech therapists whose aid can be secured during off school hours for guidance in the home.

Carcinoma of the Pancreas

Branwood (*Edinburgh M. J.*, 59: 28, 1952) writes:

Malignant disease of the pancreas is encountered frequently in hospital. The classical symptoms of painless, progressive, persistent jaundice is a late symptom of this condition, and, furthermore, the jaundice is usually preceded by pain in about two-thirds of the cases.

The physician must always be aware of the possibility of carcinoma of the pancreas in any patient who complains of obscure abdominal symptoms. The unusual character and site of the pain, associated loss of weight, and an occasional attack of diarrhœa, even when radiological examination of the alimentary tract reveals nothing, demands more detailed investigation, including perhaps laparotomy.

If these early and minor symptoms are ignored the disease progresses relentlessly with perhaps multiple venous thrombosis, more severe pain, further attacks of diarrhœa until the onset of obstructive jaundice, regarded by some as the earliest symptom, becomes the patient's death warrant.

Symptoms: *Pain* was the earliest symptom in the patients in this series. It was present in 40 of the 60 cases (66 per cent). The character and site of the pain varied. In some patients the pain was gradual in onset and usually steady and continuous. In others it was described as colicky, boring or stabbing. The most frequent sites were the epigastrium, across the upper abdomen, in the back and in the right hypochondrium.

The pain could be divided into five types depending on its character, site and radiation: (1) A dull continuous or intermittent epigistric pain, very similar to the severe pains of a peptic ulcer radiated through to the back, made worse by the intake of food and it is very severe at night aggravated by the supine position or by a sudden change in posture. (2) The second type of pain was situated in the right hypochondrium and radiated to the back and even up to the right shoulder. It was dull and aching in character but at times assumed a colicky nature. This too was intensified by food. Fourteen patients complained of this type of pain. The character and site of this could easily suggest a diseased gall bladder. (3) A constant dull boring pain situated deeply in the back was present in 4 patients in this series. This bore no relationship to food but was also worse at night. (4) Three patients complained of attacks of severe upper abdominal cramp or colic situated deeply in the middle of the abdomen. This symptom bore no relationship to the intake of food or to posture as "coeliac neurlagia." (5) Three patients complained of pain which could not be classified into any of the above groups. It was dull and boring on occasions. The ingestion of food would render the pain colicky in nature. It was felt in the back, in the epigastrium and in the right hypochondrium.

Loss of weight—This symptom was a very noticeable feature of the patients in this series. Fifty patients complained of loss of weight, 83 per cent.

Digestive disorders—A sensation of epigastric fullness associated with gastric flatulence were noticeable features in this series.

Attack of diarrhœa—The typical light coloured, bulky, greasy fæces, so characteristic of chronic fibrosis of the pancreas, is seldom encountered in malignant disease of this organ. Unexplained attacks of diarrhœa, however, are a common feature in carcinoma of the pancreas. Fifteen patients in this series, 25 per cent, complained of this spmptom. The bowel motions between these attacks are perfectly normal. The diarrhœa is described as watery in all cases. Apart from this it has no other diagnostic features, except that exacerbations of the original pain may accompany these bouts of diarrhœa. The explanation of these recurrent bouts of diarrhœa is not known, for there is no steatorrhœa and therefore improper digestion or malabsorption of fat would appear to play no part in the causation.

Jaundice—Physicians, since the time of Bard and Pic in 1888, have stressed the importance of jaundice as a feature of carcinoma of the pancreas.

Jaundice, however, occurs so late that is worthless as a diagnostic feature in the early recognition of the disease. In this series 66 per cent, ultimately developed jaundice. Only 8 patients, 5 per cent, stated that they were perfectly fit and had no immediate preceding complaint prior to the onset of the jaundice. In 40 patients, where pain was an early feature, 30 later developed jaundice. Berk stated that when pain and jaundice occur in the same patient, in 80 per cent of cases the pain comes before the jaundice. This author also found that in 14 per cent of his patients the jaundice was painless throughout the course of the disease. In 15 patients who developed jaundice, the jaundice was not progressive but fluctuated quite noticeably. This fluctuation was apparent clinically and was proved biochemically by estimation of the serum bilirubin. This intermittent jaundice is partly due to ulceration of the tumour tissue in the wall of the common bile duct, to œdema of the duct, or to spasm of the duct or sphincter produced by irrigation of the tumour. Once complete obstruction of the common bile duct has occurred then the jaundice becomes persistent and progressive type of the older writers. Jaundice is therefore a late symptom in carcinoma of the pancreas. Its presence should indicate an advanced stage of the disease and thus has no real diagnostic value.

Psychological disturbance—Depression, fear and insomnia have been described by Yaskin in patients suffering from carcinoma of the pancreas.

Thrombophlebitis. Migratory thrombophlebitis of the vessels of the legs was present in 8 of the patients in this series (13 per cent). The cause of the thrombosis is not the direct infiltration of the abdominal veins but is probably produced by an altered state of the coagulability of the blood due to the products of tumour growth and tissue destruction.

PHYSICAL EXAMINATION: *Abdominal examination* of these patients may reveal an enlarged liver, a distended gall bladder, a palpable tumour or ascites or an enlarged spleen. Abdominal examination therefore is of limited value in the diagnosis of malignant disease of the pancreas, for when physical signs are present the condition is usually far advanced.

Examination of the stool—Occult blood in the stools is therefore an important sign in these cases.

Achlorhydria—Achlorhydria was a feature in 30 patients in this series, 50 per cent.

X-ray examination—The roentgen signs are only demonstrable when the growth is large. The radiological signs, therefore, depend upon the size and site of the tumour. The radiological signs of carcinoma of the pancreas appear late in the disease. If the tumour involves the head, the distortion and other effects on the duodenum may be present early and the clinician should be aware of their significance.

CARCINOMA OF THE STOMACH

SWYNERTON AND TRUELOVE (*Brit. M. J.*, 1: 287, 1952) give in the following lines the summary of their observations:

During the 12-year period 1938-49 inclusive, 375 patients with carcinoma of the stomach were treated in the Radcliffe Infirmary. Adequate follow-up data have been obtained for all of them.

Nearly twice as many men as women were admitted, and in each sex the peak case incidence occurred in the sixties.

There was a great variation in the length of history before admission to hospital. Nearly half were admitted within six months of their first symptom, while at the other extreme nearly one in five had symptoms lasting for more than two years.

The commonest site of neoplasm was the pre-pyloric region and the least common the fundus.

More than four out of every five patients began their illness with symptoms referable to the gastro-intestinal tract, the majority suffering from some form of "indigestion." The type of indigestion was extremely variable.

An epigastric mass was felt in about half the patients by the time of admission to hospital.

A barium meal is the most accurate single diagnostic procedure. In nine out of ten patients, the radiologists reported a gastric abnormality at the first examination, and in more than four out of five correctly interpreted the findings.

Achlorhydria was a common finding, independent of the age of the patient or the site of the neoplasm. On the other hand, normal or unusually acid secretions were found in one out of four patients, so that such findings should not be regarded as any bar to the diagnosis of gastric carcinoma.

Most patients had occult blood in their stools.

Laparotomy was carried out in 63 per cent of the patients and resection of the growth in 114 (30 per cent of the total 375. An increased proportion in all age groups were treated by resection during the second half of the period covered by this study.

Resection offers the only hope of prolonged life. For example, nearly a quarter of the resected group were alive after five years, compared with less than 1 per cent of the remainder.

Among the resected group, the outstanding factor influencing prognosis was the length of history. Somewhat unexpectedly, the prognosis was found to improve with increasing length of history. The age distribution of the patients, the site of the lesion, and the possibility of "ulcer-cancers" do not explain this finding, and it is maintained that it is due to the occurrence of slow-growing carcinomata.

SCALENUS ANTICUS SYNDROME

HOLDEN AND OTHERS (*Am. J. Surg.*, 81: 411, 1951, Ref. *Circulation*, 5: 626, 1952) reviewed the findings observed in their series of 42 patients with scalenus anticus syndrome. In all instances neurologic signs or symptoms were present, while in approximately half the cases vascular findings were also noted. A consistent observation was tenderness on palpation of the belly of the scalenus anticus muscle.

The scalenus anticus syndrome was divided into an acute and a chronic stage. In the acute stage, generally a history of acute trauma could be elicited, the pain was severe and diffuse, and muscle spasm existed. A prompt response to conservative therapy generally occurred. The chronic stage was not necessarily associated with trauma, while localized paræsthesias and atrophy were more common. Complete relief of symptoms in most instances was obtained only after a scalene tenotomy. The chronic stage of the disorder frequently followed repeated prolonged exertion involving the musculature of the neck and shoulder regions.

The tests which were found of value in making the diagnosis of scalenus anticus syndrome were local tenderness of the belly of the involved muscles, the relief of pain following the injection of procaine into them, and the Adson manœuvre.

In the treatment of the condition, if the relief of pain was not satisfactory following the injection of procaine into the scalenus anticus muscle, the stellate ganglion was infiltrated. If relief of pain was now obtained, thoracic sympathectomy was performed at the same time that scalenotomy was done.

MASKING ABDOMINAL CONDITIONS WITH ANTIBIOTICS

COLE (*Am. J. Surg.*, 83: 189, 1952, Ref. *J. A. M. A.*, 149: 605, 1952) writes that the broad therapeutic spectrum of the antibiotics tempts physicians to use them indiscriminately and to neglect careful observation and exact diagnosis. In surgical emergencies the use of antibiotics may distort the symptoms as well as the objective findings; they reduce the fever and abdominal symptoms and normalize the leukocyte count. Despite this, however, the pathological process continues, and thrombosis of vessels with gangrene and rupture may occur. It is essential that the diagnosis be established before therapy with antibiotics is instituted. Cole presents four cases to illustrate those facts; in two the children had appendicitis and in the other two the patients had cholecystitis. In both of these conditions the best results are obtained with early surgery. Although the antibiotics have increased the period of safety beyond 48 hours, watchful waiting is not advisable. The use of antibiotics has given bizarre pictures in acute appendicitis as well as acute gall bladder disease. To depend on antibiotics as the treatment of choice in these diseases is to discard the only sure aid for these patients.

Œsophageal Hiatus Hernia Simulating Coronary Disease

Doak (*Southern M. J.*, 44: 918, 1952) writes that herniation of the stomach through the œsophageal hiatus of the diaphragm is not uncommon, and is noted with increasing frequency as the average age of patients examined progresses beyond 40 years. Such hiatus hernias may be asymptomatic; they may cause gastrointestinal symptoms; and they may cause pain behind the sternum, in the precordium, in the upper back, neck, shoulders or arms, in the same distribution and with the same intensity as the pains of angina pectoris or myocardial infarction. Persons with severe attacks of pain from hiatus hernia seem to have the same paralyzing fear that distinguishes angina pectoris and myocardial infarction, but the blood pressure is not lowered and the signs of shock do not persist beyond the duration of pain. Attacks of severe pain due to œsophageal hiatus hernia are not ordinarily accompanied by fever, leukocytosis, or an increased erythrocyte sedimentation rate. The electrocardiogram may indicate cardiac hypertrophy, ventricular preponderance, and other more or less specific indications of cardiac deterioration, but serial electrocardiograms will not show the progressive change characteristic of focal myocardial necrosis. In cases of hiatus hernia suggestive of angina pectoris, the two-step exercise test of Master and the anoxæmia test of Levy will not bring on the pain or reveal the electrocardiographic changes diagnostic of significant coronary disease. The author feels that all patients with symptoms of angina pectoris should be examined for hiatus herniation and should a hernia be found, the coronary circulation should be evaluated by the Master test or the Levy test. Even in the presence of proved angina pectoris, proper management of a hiatus hernia may relieve the distressing symptoms.

Fluid Imbibition as Cause of Herniation of Nucleus Pulposus

Charnley (*Lancet*, 2: 124, 1952) writes that it is customary to suppose that protrusion of an intervertebral disk is the result of external mechanical factors acting on the spine. To make this explanation more acceptable, it has been suggested that the disk that herniates is not normal, and that a force that could not harm a normal disk might affect a "degenerating" disk. However, this explanation is not satisfactory; because the "degenerative" process seems to be mainly one of dehydration, and this is not the physical state that would predispose to protrusion. In this report the author presents clinical and experimental evidence that protrusion of a nucleus pulposus might result from intrinsic causes in the disk, and that in certain circumstances the nucleus may swell and extrude itself spontaneously. There are several features in the lumbago-sciatica syndrome that make it difficult to postulate an external mechanical cause: 1. Though the acute lumbago syndrome can follow sudden severe strains in lifting heavy weights, oftener it starts without recognizable injury. 2. The lumbago-sciatica syndrome often follows exposure to wet and cold. 3. The pain of acute lumbago is quite unlike the pain that follows a severe injury to the spine. 4. Severe injuries of the spine rarely cause immediate sciatica. 5. A sudden, violent attack of sciatica is often preceded by a prodromal phase. The experimental evidence presented here was obtained after imbibition of isotonic or hypertonic sodium chloride solutions by intervertebral disks in the lumbar spine of fresh human cadavers. It has been generally accepted that the nucleus pulposus contains a substance of the nature of a mucopolypeptide with hydrophilic properties. It is now postulated that under certain conditions the disk may absorb an abnormal amount of fluid, producing an abnormally high internal pressure, and that this sudden tension inside the disk may result in acute lumbago. The conditions that could precipitate this episode of hypertension might be varied and, though unlikely, could even be infective as, for instance, after exposure to wet and cold. Once the pressure has risen inside the disk, a protrusion may start, and thereafter slight injury may complete the bursting of the annulus. An external protrusion impinging on a nerve root may then cause sciatica. If this hypothesis proves correct, prophylactic medical treatment of lumbago may become possible.

CURRENT TOPIC

PHARMACEUTICAL INDUSTRY AND MEDICAL MEN

Dr. S. K. Raichaudhury of the pharmaceutical department of Karamchand Thappar and Brothers, Calcutta, in an address at the Kanpur Branch of the I. M. A. said:

It appears rather curious that a medical man, whose fuction is that of a "healer of human ailments", should also divert his attention towards the intricacies of pharmaceutical industry for which a particular section, I mean the group of pharmaceutists, is specially engaged. But when we go deeper into the aims, objects and developments of pharmaceutical industry, we can hardly deny that the medical profession who have to assess the therapeutic value of pharmaceutical products in course of their clinical practice, have also an immense scope for contribution towards the development of this industry.

Pharmaceutics, which is an essential component of medical science, deals with the important section of preparing the right type of medical product according to the doctor's recipe. Medical men have all been taught in their classes of materia medica, pharmacology and therapeutics, the names, identities, pharmacological action and the therapeutics of many drugs; herbs, animals and chemicals. They have also been taught the ways as to how to combine them according to a particular recipe. So, according to Charaka, out of the four pillars of treatment, e.g., *physician*, *drug*, *nurse* and *patient*, the first two, *physician* and *drug* come under doctor's organisation. As soon as a doctor assumes the status of a '*healer of ailments*' his duty does not simply end after imparting an expert advice to the patient. He has to be satisfied that the recipe, as advised by him, is properly prepared and administered. Pharmaceutics is the basic science that helps to prepare the recipe. If the doctor maintains his own dispensing section, his personal knowledge of pharmaceutical chemistry is employed to discharge this responsibility. If he is attached to a pharmacy, he has to depend considerably upon a qualified compounder for this important job.

This dispensing business, however, is inseparably connected with the manufacture of medicines in which the knowledge and application of pharmaceutics are given the widest scope for perfection. If pharmaceutical industry goes on making steady progress in turning out dependable pharmaceuticals, much of the anxiety of the doctor is minimised. But what are the essential factors that require our close attention for the growth and development of pharmaceutical industry in India, particularly at the present moment? To my mind, among other points, a lively interest from the medical profession stands supreme. This reminds me of a cursory remark of the

late Sir Nilratan Sircar, the Doyen of our Profession on one occasion,—"if there is a sudden deluge to wash away all the medical books except only Hale and Whites' Materia Medica without impairing the medical knowledge of the best of medical profession, the science of healing would be revived *de novo* and remedies after remedies would again be discovered by medical men to suit their necessities in the treatment of human maladies". By referring to this great imagination I mean that creative genius for solving the problems of treatment would definitely emanate from the basic knowledge of medicine which only a properly trained and experienced doctor could have. Pharmaceutical industry could only carry out the ideas of the medical profession to fruitful action. I remember in this connection the ardent collaboration of the late Sir Kedarnath Das, one of the greatest gynæcologists, in the perfection of a special ergot preparation, e.g., liquor ergot fortis when I just stepped into this industry. He contributed his part exclusively as an advising obstetrician, but his ideas were translated into action by persevering pharmaceutical chemists.

Even in foreign countries hardly do we come across any achievement in pharmaceutical chemistry without the close cooperation and guidance of medical genius. Leaving aside those original inventive contributions of eminent medical personnel to the manufacture of biological products, if we simply focus our attention to the present age since 1944 when penicillin therapy was universally accepted, we could find the convincing observations from so many medical men such as, Cairns, Humphrey, Southwell, Roxburgh, Dodds, Romansky, Taylor, Ferguson and so on. The role, this large group of medico-scientists has been playing is pre-eminently towards the therapeutic aspect and therefore, their opinions are much more valuable although the claims of the pharmaceutists, I mean the actual manufacturers, have to be equally recognised.

But much earlier, about three-fourths of a century ago, Pasteur, who was not a medical man, first conceived the idea of penicillin through the same accident by which Fleming discovered penicillin in 1928. After making various experiments on anthrax bacilli, Pasteur proved that the products of certain bacteria could annihilate other bacteria. So, in 1876 he spoke like a prophet in his "Studies on Fermentation", "I am convinced that the day will come when the moulds will be used in certain industrial operations by virtue of its capacity to destroy organic matter." On the basis of these great scientific imaginations Pasteur established the fundamentals of the philosophy which, later on, crystallised in the discovery of penicillin in our age. Scientific ideas continue to live and so this chain of thinking led ultimately to the various experiments of Tyndall as published in 1881 regarding floating matter of the air in relation to putrefaction and infection. The third and the last attempt in the evolution of this chemotherapeutic agent, which is being successfully employed now on millions and millions of patients daily for various physical disabilities, attained its goal in 1928 at the hands of that English doctor, Fleming at the St. Mary's Hospital. Penicillium notatum became isolated from its twin brother, Penicillium glaucum and penicillin after undergoing various stages of perfection occupied the unique position in the production of *non-toxic bacteriostasis*. This 'magic bullet', I mean, penicillin of which Ehrlich dreamed has also been preceded by great advances over the old antiseptics which were more toxic to leucocytes, the defensive organism of the body, than to bacteria themselves. The sulphonamides which came before the medical profession as a great relief formed the successful 'chemical wall' to encircle the pathogenic bacteria. Although they were more toxic to bacteria yet they created a great problem in our therapeutics as they were toxic to human cells as well. To our great satisfaction, the organic structure of the sulphonamides have been subjected to so many modifications within the last few years in order to minimise the toxic levels. I must unhesitatingly assert that this progressive evolution in pharmaceutical chemistry has been possible only through the intimate understanding between chemists and medical men.

In India, the co-ordination between medical profession and pharmaceutiful industry has yet to be achieved in full measure. It will not be too much to say that the enterprises in pharmaceutical industry could not receive any planning from the State during the two centuries of British rule.

The present Government has also not come forward to ameliorate the conditions created by the British Government. On the other hand, public bodies such as Indian Chamber of Commerce, Indian Chemical Manufacturers' Association and even Indian Medical Association have not yet taken up our problems in a detailed way and become fully determined to produce all our requirements through our own industrial organisations. I think you will kindly excuse me if I say that such a state of things is exclusively due to want of planning.

I would, therefore, appeal to you and you only, the users of products, to review the present activities of pharmaceutical industry in India as you are the only persons who have the real authority through your profession to accept or reject the products of industry for your patients. It will not be too much for me to say that unless you extend your sincere collaboration to pharmaceutical industry with your suggestions, guidance and constructive criticism the industry can never thrive nor correct its errors. As already stressed upon, pharmaceutical industry cannot be and should not be a close preserve of non-medical chemists nor of astute commercialists. About 25 years ago when I became attached to this industry per chance, late Acharya Prafulla Chandra told me incidentally "A doctor in pharmaceutical industry makes a lot of difference with a pharmaceutiful chemist, however qualified the latter might be. I fail to understand why every doctor should jump into his profession with hypodermic syringe?" It goes without saying that this great sage though a towering chemist himself, foresaw the absolute necessity of medical men for the growth and development of pharmaceutical industry, he loved so dearly. Perhaps this angle of vision was responsible for his selecting Dr. Kartick Chandra Bose, as the first Manager of Bengal Chemical and Pharmaceutical Works, Ltd.

Fortunately, within the last 25 years medical genius has been to some extent attracted towards the well-being of this industry in India. The most important personality who has made a tremendous contribution towards the perfection of Indian medicines is Col. Sir R. N. Chopra at whose initiative standardisation of drugs has been made now the watchword and who has also been the architect of the present Drugs Act and Drugs Rules for the control of this industry in a scientific way. The contribution of his worthy disciple Dr. B. Mukherji, the present Director of the Central Drugs Research Laboratory, Lucknow, has also to be remembered by us with pride and gratitude. I think I should not be misunderstood by my chemist friends when I claim that the success of these two great scientists is mainly due to the fact that they are doctors first and then chemists. Incidentally, I would like to refer also that late Sir U. N. Brahmachari could not have perhaps attained the world-wide fame for his Urea Stibamine had he not been an ardent clinician in the Kala-Azar Ward of Campbell hospitals, Calcutta, when

patients were helplessly dying for want of a rational anti-kala-azar remedy.

While referring to the above fact, I never mean that doctors should leave aside their stethoscope and syringe and choose for careers in pharmaceutical industry. I would like to emphasize that in the interest of development of this industry in India they should come forward with their willingness to understand, criticise and give a fair clinical trial to the Indian products. Moreover, they should have an abiding interest in the activities of the various pharmaceutical concerns which should always receive suggestions regarding the manufacture of the products which they require for amelioration of human maladies. An eminent medical practitioner has always to exhaust his ingenuity for suggesting a suitable recipe for his patient. He gets some remedies readily offered to him by the industry, local and foreign: for a few others which suggest to his mind, he has to think of some sort of assistance from the industry.

When we analyse the achievements, already attained by pharmaceutical industry in India, we could more or less proclaim self-sufficiency so far as B. P. Pharmaceuticals, Biological products (e.g., Vaccines, Sera and Bacteriophage), Chemical Injections and Surgical Dressings are concerned. During the last war about 70 per cent of the entire civil and defence requirements for drugs and medicines could be met by Indian manufacturers who have always kept down price levels for the benefit of the public. Regarding quality also, the Indian Pharmaceutical industry has shown enormous progress. I would like to quote in this connection the candid observations of the Pharmaceutical Journal of America, September 1949, on the standardisation of Drugs in India. These observations were based on the review of work at the Biochemical standardisation Laboratory, now transformed into Central Drugs Laboratory. 'The activities of the Laboratory are reviewed under eight subheadings. About 1,200 samples of drugs, medicinal chemicals, biological products, insecticides, disinfectants, surgical dressings and laboratory glass wares were tested: 82 per cent were of standard quality. Some of the pharmacopœial and codex drugs examined showed some improvements of quality compared with the second triennial report. They will improve further still if backed by the people and medical profession. The drug analytical work and standardisation have been carried on in the right direction in the laboratory thereby increasing the production of pure drugs. Besides drugs and injections, the industry has also explored quite a large number of indigenous products from the various medicinal herbs described in Ayurveda as suitable remedies in certain ailments. The modern knowledge of chemistry and pharmacology and the pharmacopœial methods as modified to suit certain conditions have been sufficiently exploited to manufacture these indigenous products as scientifically as possible. It cannot now be denied that these products have more or less been accepted by the medical profession. Further the recipe of many well-known foreign patent medicines have been carefully studied and modified to offer many ready-made medicines to the medical men. The idea behind this move has always been to offer cheaper substitutes of foreign well-known products to the public. During war period these substitutes met the demand of the people quite adequately. I could speak from my personal experience in this industry covering about quarter of a century that the Indian medical profession have always extended their unstinted support to these drugs. The hospitals have offered most willing co-operation to scientific and ethical products for their clinical trial. Institutions like the School of Tropical Medicine and All-India Institute of Hygiene and Public Health, Calcutta, have also permitted the Research Workers attached to them to publish scientific papers on such products.

While referring to the immense service rendered to pharmaceutical industry by the Biochemical Standardisation Laboratory and the groups of scientists attached thereto it must be said that the advent of the 'Drug Act' has marked a new era in the relation of the medical profession to the indigenous drug industry. Formerly medical men had to rely on certain brands to ensure the genuineness of a product. Now this responsibility has been taken over by the drugs controller and the Government analytical laboratories. With their help we in the medical profession can use products of Indian concerns with profound reliance. In the absence of any approved standardisation authority in the country we were quite justified previously in using the imported products of well-known foreign concerns even at high cost. But unless we believe in the fetish of brand names rather than approved methods of chemical and biological assays of the pharmacopœias, we cannot very well ask our patients to pay the high cost of imported drugs when equally potent drugs can be obtained in India. We can no longer shut our eyes to the glaring fact that Indian pharmaceutiful manufacture controlled by the Drugs Act organisations of Government is coming to its own rightful status and it is high time that we, doctors play our part in becoming acquainted with (i) the concerns whose products we use—how they are manned, how they are equipped, how they standardise their products and (ii) the Drugs Act authorities and get their opinion as to which Indian product can be relied on.

This reminds me of the days when it was customary for patients to call in a European doctor whenever a serious case happened. Luckily for patients and the profession this mentality changed long ago, so that to-day we hardly perceive the necessity of the European doctors unless we come across some exceptional medical talents. I could foresee therefore, similar co-operation amongst doctors, manufacturers and patients in respect of Indian made medicines.

I would appeal to you with all emphasis at my command to consider all the pharmaceutical concerns as laboratories open to all where you have got your rights to get your requirements prepared according to your needs. You have every right to analyse, examine, criticise, reject and accept the products which are offered to you by the industry. It is up to you to make it a pastime during your leisure hours to visit these laboratories and discuss with their technical personnel, exchange your views with them and give the benefit of your medical knowledge and clinical experience. We are no more tied to the foreign yoke and we have our rights for self-determination in every walk of our life. The drug industry of India will be a glory to you if you can help it to grow to its desired heights. Your role, as I have already stressed upon, is the most paramount and the industry can never make headway without your helpful collaboration. The pharmaceutical concerns also should leave no stone unturned to create a lasting contact with you in every possible way. Just as the West has given us antibiotics which India is also trying hard to produce, a day may come when we shall also be able to revive our Ayurvedic and Unani drugs, as perfected through our modern scientific ways and extend the same beyond the shores of India. We have to seek in our ambitious brain the same impetus which leads a nation towards the road of self-sufficiency. I would request you to consider your role in the rise of this industry as a part of your duty to the nation.

NOTES AND NEWS

ALL-INDIA OBSTETRIC AND GYNÆCOLOGICAL CONGRESS

The 7th All-India Obstetric and Gynæcological Congress will be held in Calcutta on December 22nd to 24th, 1952. Dr. (Miss) H. M. Lazarus, C.B.E., F.R.C.S., F.R.C.O.G., F.A.C.S. of Vellore will preside. Dr. B. C. Roy, Chief Minister of West Bengal will inaugurate the Congress and Dr. H. C. Mookerjee, the Governor of West Bengal will be the chief guest.

All registered medical practitioners of West Bengal can enrol as members of the Reception Committee on payment of Rs. 10/- only, non-medical persons, on payment of Rs. 20/- only. Members of the various obstetric and gynæcological societies in India can attend the Congress on payment of a fee of Rs. 5/- and other medical persons on payment of a fee of Rs. 4/- only.

INTERNATIONAL CANCER RESEARCH COMMISSION

Meetings of the International Cancer Research Commission will be held in Bombay from 30th December, 1952, to 2nd January, 1953. Two symposia on (1) Geographical Pathology of Cancer in Asia and (2) Chemotherapy of Cancer, are being organised during the session of the Commission in Bombay. Medical men and scientific workers interested in these symposia are cordially invited to attend. Exact time, place and date will be announced later on.

CIRCULATING LIBRARY OF INDUSTRIAL MEDICINE, INDIA

In his presidential address at the second All-India Conference of Industrial Medicine Sir Jehangir Ghandy, Kt., C.I.E., Resident Director of the Tata Iron and Steel Co., and an Honorary Member of the Society for the Study of Industrial Medicine, said, "There are over 13,000 factories registered in the country—the majority of them small—which are equipped with First Aid or Medical Units but few have any reading facilities for the medical staff, neither is it economical for smaller concerns to have libraries of their own. A strong case, therefore, exists for the creation of a central library for industrial medicine from which books and periodicals can be borrowed by member doctors through the post if necessary. Such a system has worked quite satisfactorily in progressive countries like U.S.A. and U.K. and there is no reason why it should not work with equal success in this country. I think the Central and State Governments, the educational institutions and the industries themselves likely to benefit from such a library could be asked to contribute for its cost and maintenance." *Proceedings of the Society for the Study of Industrial Medicine*, Vol. IV, No. 3.

WHO REGIONAL COMMITTEE FOR SOUTH-EAST ASIA

The Fifth Session of the South-East Asia Regional Committee of the World Health Organisation lately terminated its five days of meetings during which it endorsed the 1954 regional health programmes involving an international expenditure of four million dollars (U.S.), recommended the re-appointment of Dr. C. Mani as Regional Director for a further period of five years, passed resolutions of regional importance and held technical discussions on rural health personnel and services.

Health projects for South-East Asian countries for 1954 involving WHO assistance of a total value of over two million dollars (U.S.) were endorsed by the Programme Sub-Committee under the Chairmanship of Dr. C. K. Lakshmanan (India). These projects also involved a further expenditure of a million and a half dollars from the U. N. Children's Fund (UNICEF) and from other sources bringing the total of international expenditure to four million dollars. The 1954 programmes include the continuation and expansion of the existing projects or the launching of new ones in the following fields—control of yaws, tuberculosis, malaria and other communicable diseases, the strengthening of teaching and training institutions for doctors, nurses and other health training and the award of fellowships in nutrition, health education, mental health, public health administration, and environmental sanitation.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE ON POLIO

Dr. John R. Paul of America's Yale University School of Medicine, addressing the Second International Congress of Internal Medicine at London said:

"Countries with high standards of sanitation have experienced high rates for poliomyelitis during the late generation, whereas in crowded unhygienic cities, polio remains as it did in the nineteenth century—largely endemic and a disease of infants."

Dr. Paul added that in the United States and some other countries polio was found more often among older children than among infants. He said one possible prevention might be the use of concentrated immune serum (gamma globulin) from recovered patients to give temporary protection to exposed patients.

Describing polio as a tropical disease which strays periodically into temperate climates Dr. Paul stated that experiments on preventive polio methods were now being made at Houston, Texas.

CONFERENCE OF OTOLARYNGOLOGISTS OF INDIA

The Fifth Annual Conference of the Association of Otolaryngologists of India will be held under the presidentship of Dr. S. Roy, M.P. and inaugurated by H. E. the Governor of Bihar at Patna on 22nd December, 1952. Scientific Sessions will be opened by Hon'ble Minister for Medical and Public Health.

Amongst the many papers that will be read, "Atrophic Rhinitis", "Cancer Larynx", "Rehabilitation of the Deaf" may be mentioned.

E. R. SQUIBB & SONS COMBINE WITH MATHIESON CHEMICAL CORPORATION

It is learnt that E. R. Squibb & Sons have recently combined with the Mathieson Chemical Corporation of U.S.A. It may be recalled in this connection that in the year 1950 Sarabhai Chemicals of Baroda in India combined with Squibb to manufacture Squibb products in India.

BILL FOR PREVENTING ADULTERATION OF FOODSTUFF

The Health Minister, Rajkumari Amrit Kaur, introduced a Bill seeking to enact a Central Law for the whole country for the prevention of adulteration of foodstuffs.

Adulteration of foodstuffs and other goods is now included in the Concurrent List in the Constitution. The proposed all-India legislation will replace local food adulteration laws where

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COL. H. E. SHORTT, Director of the Department of Parasitology and Professor of Medical Protozoology, London School of Hygiene & Tropical Medicine, writes in the FOREWORD:

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they exist and also apply to those States where there are no local laws on this subject.

Among other things, the Bill provides for a Central Food Laboratory to which food samples can be referred for final opinion in disputed cases and a Central Committee for food standards consisting of representatives of Central and State Governments to advise on matters arising from the administration of the Act.

RADIOISOTOPES IN CANCER RESEARCH

The importance of radioactive isotopes in speeding progress in cancer research has been outlined by Dr. Shields Warren, Director of the Division of Biology and Medicine, United States Atomic Energy Commission, in a paper presented to the American Association for the Advancement of Science, and published recently in the *Journal of the American Pharmaceutical Association* (13: 108, 1952).

For 40 years after the addition of radium to the methods of treatment of cancer, there were many refinements in therapy but x-rays, surgery, and radium remained the basic methods. Both x-rays and radium affected all cells within the path of their radiations, and the extent of damage to tumor tissue depended upon the amount of radiation that could be delivered without too great damage to normal tissues, and upon the relative sensitivity of the tumor cells. Radioactive isotope treatment allows localization of therapeutic radiations to a far greater extent than the previous techniques. Since the amount of radiation that can be tolerated over the entire body is slight, x-rays and radium are given over restricted fields; whereas those isotopes which are selectively absorbed can be administered by mouth or intravenously, to be concentrated and to exert their chief effects in tumor tissue. Isotopes can be administered quickly and easily, and they continue to exert effects until excreted, or until their radioactivity has decayed to the point of ineffectiveness; whereas x-rays or radium act only during the period of their application.

In the field of cancer research, carbon 14 is probably the most widely useful radioactive isotope, largely because carbon is such a key substance in almost all biologic systems. The long half-life of carbon 14 makes it an ideal material with which to work.

Phosphorus 32 has also proved very useful in cancer research and in certain diagnostic procedures.

In the field of diagnosis of cancer, radioactive iodine has proved of great value in the recognition and localization of certain types of thyroid cancers, and in the diagnosis and localization of brain tumors. Radioactive phosphorus, in addition to the diagnostic use already mentioned, is serviceable in the recognition of breast cancer.

Radioactive gold finds use in cancer therapy, by slowing the formation of excess fluid from tumor cells, which may be a very troublesome symptom.

An isotope of particular interest is cobalt 60, which can be used as a substitute for radium either for direct implantation in tumors or as a powerful external source of radiation. Since cobalt can be made radioactive much more cheaply than radium can be mined and isolated, there is a very definite advantage in using this material.

Though a number of isotopes have proved useful in cancer treatment, they have—as a whole—proved disappointing. Much work must still be done in this field.—*Science and Culture.*

A NEW ANTI-MALARIAL DRUG

"Daraprim" a new anti-malarial drug (*Science and Culture*, 18, 145, 1952) is 2:4 diamino p-chlorophenyl—5. ethylpyrimidine, and is the most active of a large series of substituted 2:4 diamino-pyrimidines which have been synthesized and tested against laboratory infections of *Plasmodium gallinaceum* in chicks and *P. Berghei* in mice (*Brit. J. Pharmacol*, 6: 186, 1951). Trials in quiescent cases of human malaria have been reported by Archibald (*Brit. M. J.*, 2: 821, 1951) and in overt infections of *P. falciparum* and *P. malariæ* in man by McGrager and Smith (*Brit. M. J.*, 1: 730, 1952). They concluded that it has a powerful action on schizonts and a lesser and inconstant action on trophozoites. It acted as swiftly in non-immunes as in others possessing partial immunity; it is tasteless and no toxic reactions of any kind were observed. The drug is an effective suppressant of *P. falciparum* infections, even in doses as small as 5 mgm. daily. Goodwin (*Brit. M. J.*, 1: 732, 1952) took this amount daily for one year. During this time he deliberately exposed himself to the bites of four mosquitoes later shown to be infected with *P. falciparum*. He also slept without a mosquito net for six months while in West Africa. Throughout this period there were no toxic manifestations, and no abnormalities were produced in the blood, bone marrow, or urine. To each of a group of volunteers in England, 50 mgm. of the drug was given twice weekly for three months. Again there were no demonstrable effects on the urine, blood, or erythrocyte sedimentation rate. Although it is too early to assess the value of this drug, and there are as yet no reports on its action in *P. vivax* infections, its aschizonticid efficiency in *P. falciparum* and *P. malariæ* infections appears to lie between that of paludrine and chloroquine. —*Nature.*

DR. BAUER, PRESIDENT A.M.A. & SECRETARY GENERAL W.M.A. VISITS INDIA

Dr. L. H. Bauer, President of the American Medical Association and Secretary General of the World Medical Association recently paid a short visit to India at the invitation of the Indian Medical Association. He reached Delhi on the 22nd October, 1952, and visited Bombay, Madras and Calcutta. At these places, he addressed members of the Medical Profession, held Press Conferences and visited hospitals. In his speeches he explained the work of the American Medical Association in details. He also examined the medical problems of India, particularly the rural problem. He said "To my mind very great emphasis should be laid on the question of housing and nutrition. Your housing and nutrition problems call for urgent tackling. Again it is always better to take steps for prevention of diseases, and if you can successfully tackle these two, you will take a long step towards solving your rural health problem".

Dr. Bauer was impressed with the great progress that India has made in course of the last five years of independence.

ALL-INDIA LEPROSY WORKERS' CONFERENCE

At the invitation of the Orissa Branch of the Hind Kusht Nivaran Sangh the Fourth All-India Leprosy Workers Conference will be held at Puri from January 4 to January 6, 1953. Shri G. V. Mavalankar, Chairman of the Gandhi Memorial Leprosy Foundation and Speaker of the Indian Parliament, will preside.

The Conference is open to all medical, para-medical and social workers directly engaged or interested in leprosy work

or connected with any organisation doing or furthering anti-leprosy work in the Indian Union or elsewhere.

The Conference will discuss: (i) Classification of Leprosy, (ii) Role of New Drugs in the Treatment of Leprosy, (iii) Some Aspects of Pathology, Bacteriology and Immunology of Leprosy including the possible Role of B.C.G. vaccination in the Control of Leprosy, (iv) Report on Anti-leprosy Work, and New Schemes in the State.

Discussions on all the medical subjects will be held under the auspices of the Indian Association of Leprologists and its President, Dr. Dharmendra, will preside.

The First Biennial Meeting of the Indian Association of Leprologists will be held on January 7 at the venue of the above Conference.

Delegates attending the Conference will have the advantage of a single fare double railway journey. The delegation fee is Rs. 10 only inclusive of board and lodging.

Persons interested may communicate with either the Secretary, Reception Committee, IV All-India Leprosy Workers' Conference, Cuttack 2 (Orissa) or the Hony. Secretary, Indian Association of Leprologists, Leprosy Department, School of Tropical Medicine, Calcutta—12.

CORRESPONDENCE

The Editor is not responsible for any views expressed by the contributors

COLLECTION OF SPUTUM FOR CULTURE OF ACID-FAST ORGANISM

SIR,—This anomaly of ordinary smear report for A. F. B. being positive while culture report, which is definitely more sensitive being negative, must be the experience of most of us. Those of us who have been working in T. B. clinics or T. B. outpatient departments often get a shock when the ordinary smear report is 2-3 bacilli per field while the culture report comes as no tubercle bacilli colony grown. We often blame the culture technique or the media, or pass it off as "it is too difficult to grow the tubercle bacilli." Below I am giving my finding and suggestion and invite the opinion of others through your journal

It is the usual practice to suggest to a patient to collect the 24 hr. sample of sputum in a wide-mouthed bottle. The patient collects the sample in a clear glass bottle and then brings the sample from his home to the outpatient department or the clinic, or to the pathologist. The bottle is exposed to diffuse or indirect light at home and at times to direct sunlight while on transit. Now that we know how susceptible the tubercle bacilli are to light, especially sunlight, no wonder the culture report comes as negative, though the sputum may be loaded with tubercle bacilli. What I have been doing with my patients is to advise them to collect the sample in either a cigarette tin and keep it always covered or in a dark glass bottle. And the positive culture reports have increased to a remarkable extent. As I have not been able to work out this observation on a great number of patients, I invite the opinion and observations of other workers

K. K. SINHA, M.B.B.S., D.T.D.,
Medical Officer.

T. B. Demonstration Centre,
Patna.

INTRAVENOUS IRON

SIR,—On page 87 of Vol. XXII No. 2 (November 1951) under the heading of Intravenous Iron, Dr. Chamanlal Talwar has made a mention of the delicate jerk which if noted in time saves one from looking at the barrel, etc. I may venture to say that there is no need to look for this jerk because sometimes blood in the vein may not be under enough pressure to cause this jerk. However, if one is careful enough to look at the barrel (of course after the needle is is in the vein) he will find that the blood that enters the barrel clearly remains over the column of the fluid and at the same time there is formed a distinct line of demarcation between the columns of the Iron and the blood. With this, one is sure that the needle is in the vein. I am, etc.

Baroda, 6-11-52. K. D. SHAH, M.B., B.S.

A NEW METHOD OF PAINLESS DELIVERY WITHOUT DRUGS OR INJECTIONS

SIR,—This new method is a Russian discovery and is being practised in hospitals in China for the last 3 or 4 years.

From the antenatal clinics the expectant mothers are sent to hospitals for learning the technique of this method of easy delivery 3 or 4 weeks before their due time.

These mothers have to visit the hospitals daily or every other day to learn the technique by practice. The practice consists of exercise in deep abdominal and chest breathing.

The expectants enter hospital 2 or 3 days before their time and do the ordinary work. They walk about till the os dilates to a fair size and then the lady takes to bed and begins abdominal breathing and as the delivery advances, starts chest breathing. The patient only feels a certain tension in the abdomen.

This process seems to be incredible but I actually saw a case of delivery in one of the rooms. The patient was laughing all the time. Not believing my own eyes I enquired from the American lady, who was a delegate to the Peace Conference, and was delivered in one of the rooms two days before and she confirmed that she underwent the same process and was delivered without pain.

Jubbulpore, 7-11-52. (DR.) GEORGE DA SILVA.

REVIEWS

TOPICS IN PHYSICAL CHEMISTRY—W. Mansfield Clark, PH.D., SC.D., Second edition. Bailliére Tindall and Cox, London 1952, pp. xvii + 777, 176 figures. Price 76s. 6d. net.

Lavoisier's famous dictum: 'La vie est une fonction chimique' may be said to be the beginning of biochemistry though the foundations of this science were laid more than a century later. The importance of the study of chemistry especially organic and biochemistry to students of medicine has been realised for quite some time. The study of any branch of chemistry must necessarily be based on the two legs of general chemistry and physical chemistry.

The volume under review, the publication of the second edition of which amply proves its usefulness, is a course in physical chemistry meant especially for students of medicine. In the study of any science it is fundamentals that matter much more than details which one can always look up. The author has therefore very rightly laid the greatest stress on

driving the fundamentals home. In fact the experience of many teachers in this country, an experience which the reviewer is inclined to think is shared elsewhere, is that the unteaching of useless accretions of facts without the underlying principles is the teacher's foremost and toughest job. Quite a few textbooks neglect fundamentals for details.

Dr. Clark chooses his 'topics' with care and these are particularly suited to the class of readers they are meant for. The emphasis given to measurements of mass and volume is very welcome.

Altogether an excellent and well produced introduction to physical chemistry for students of medicine and of elementary biochemistry.

BRITISH MEDICAL BULLETIN—Vol. 8, Nos. 2-3, 1952.

This issue of the Bulletin is particularly interesting as it deals with the subject of isotopes in Medicine. Isotopes have recently brought a new era in research and therapy. The course of radioactive elements introduced into living systems can be followed with great ease, their role in metabolism and their elimination can be measured with accuracy. Instead of wandering in wilderness the research workers can now with the help of isotopes give their interpretations and data with greater confidence. It is therefore gratifying that the Editors have brought out an issue which exclusively deals with this comparatively new subject. The articles are from eminent scientists covering various subjects and they give an excellent idea of the work that is being done in this line at present in the United Kingdom. There are articles dealing with the technicalities and methods employed, others are devoted on physiological studies particularly dealing with the use of radioactive iodine in thyroid metabolism and disease, measurements of blood volumes, CO_2 exchanges, plasma protein and metabolism, etc. Radioactive isotopes have been applied in the studies on penicillin, vit. B_{12}, antigens and antibodies, the investigations have yielded useful informations and will help to solve many complex problems. The utilization of radioactive bodies in diagnosis and therapy of malignant conditions and also in plastic surgery augers a newer approach to problems where so far we felt helpless. Special articles are also devoted to the problems in the handling of isotopes and informations are available on the procurement, production and supply of radioisotopes in Great Britain. In fact, the Bulletin will be of a great educative value and will be very much appreciated by those who are anxious to know about the new developments in this field. There are also two articles of general interest, one dealing with the subject of Medical Libraries of Great Britain, and the other on real nutritional deficiency. We congratulate the Medical Department—The British Council for this excellent publication.

AIDS TO OSTEOLOGY—By Nils L. Eckhoff. Fifth Edition, 1952, Pp. viii and 264, with 42 figures. Bailliére Tindall and Cox, 7 and 8, Henrietta Street, London, W.C.2. Price 6s. 6d. net.

This is another useful member of the student's "Aids" series and conforms to the usual style and get-up of the series. The text is ably presented, well written, divided into several convenient useful chapters. The diagrams are excellent and, although in black and white, depict the figures very well through careful blending of lines and flutings. Due to this the outlines of the different bones round about a joint (as in the orbit) as well as the attachments of muscles, are clearly indicated. The book will serve as an efficient guide and handbook for students preparing for examinations.

A SURVEY OF CANCER IN LONDON—Report of the Clinical Cancer Research Committee—By W. L. Harnett, C.I.E., M.D., F.R.C.S., LT.-COL., I.M.S. (RET.). Published by the British Empire Cancer Campaign, 11 Grosvenor Crescent, Hyde Park Corner London, S.W.1. Price, paper bound £2 5s., postage extra.

The British Empire Cancer Campaign appointed a Clinical Cancer Committee in 1935 to obtain complete data and information about the efficacy of the various methods of treatment available and other factors relating to the incidence of cancer in different parts. The sub-committtte thereafter drafted the case-sheets for recording the details of the cases seen by all the voluntary and L.C.C. hospitals and most of the special hospitals which co-operated in the Clinical Research. By the end of 1938, the committee had received back 8,480 case-sheets, duly filled in. The five-year follow-up period ended in 1944 and many cases were properly traced, later on, when the hospitals settled back in London after the last war.

Statistical analyses and a general summary of the findings in the whole series of the 15,201 cases are included in this voluminous and highly informative book running into 803 pages of text. The book contains a wealth of information and also the careful statistical analyses of the large number of case-sheets recorded. Antopsies were performed in 23·9 per cent of the cases studied. This is a very valuable book containing data and informations which cannot be found elsewhere; and should be in the library of all doctors and institutions who have to deal with cancer of any type.

PHARMACOLOGY, MATERIA MEDICA AND THERAPEUTICS—By B. N. Ghosh, F.R.F.P.S. (GLAS.), F.R.S. (EDIN.). Demy octavo, pages xvi and 860. Nineteenth edition, 1952. Scientific Publishing Co., 85, Netaji Subhas Road, Calcutta, 1. Price Rs. 20/- or 30s. net.

This book started its career in 1901 and has passed through to its present nineteenth edition in over half a century of its existence. But old age is not the only virtue of this very useful book. The text of the book has been thoroughly revised in this edition, and most of the modern advances have been duly included. Antabuse for chronic alcoholism, noradrenaline, dexedrine, priscol, kemithal, dextran are a few of the newer inclusions in the text. The anticonvulsant and antihistaminic drugs have been liberally dealt with. ACTH, aminopterin, nitrogen mustard, aureomycin and terramycin have all been duly discussed. Radioactive Isotopes have been briefly described for inquisitive students.

This book is a very good textbook for the student who probably has the passing of his examinations as his immediate objective. But the student will find that this book serves him well as a handy reference book and so will a busy practitioner who often does not have the opportunity to look up many of the newer advances.

HISTOPATHOLOGICAL TECHNIC—By Aram A. Krajian SC. D. and R. B. H. Gradwohl, M.D. Second edition, 1952 with 131 illustrations and 7 colour plates. C. V. Mosby Company, St. Louis, U.S.A. Price $6·75 (Sh. 28-11).

This neat little book, in its 349 pages of text clearly describes the various histopathological technic as may be of everyday necessity for pathological work to medical students, technicians, research workers and laboratory directors. Besides the standard regular and accepted methods, many other original and modified methods, for various types of

histopathological work, have also been put forth and most of these have been found to be rapid, economical and practical methods by the authors. Illustrations are plentiful, detailed guidance makes the book very useful to those engaged in histopathological work.

ATLAS OF TUMOR PATHOLOGY—Published by the Armed Forces Institute of Pathology under the auspices of the sub-committee on Oncology of the Committee on Pathology of the National Research Council, Washington, D.C., U.S.A., 1949. (For sale by the American Registry of Pathology, Armed Forces Institute of Pathology; Washington 25, D.C.

Section II, Fascicle 6—Tumors of the Peripheral Nervous System. By A. P. Stout, M.D.

Section III, Fascicle 9—Teratomas by R. A Willis, M.D.

Section IV, Fascicle 16—Tumors of the Carotid Body and Related Structures—By P. M. Le Compte, M.D.

Section V, Fascicle 18—Tumors of the Mediastinum. By H. G. Schlumberger, M.D.

Section VIII, Fascicle 29—Tumors of the Adrenal. By H. T. Karsner, M.D.

Section IX, Fascicle 34—Tumors of the Breast. By F. W. Stewart, M.D.

A conference of specialists on various subjects was held in accordance with a suggestion made, at the Fourth International Congress for Cancer Research held at St. Louis (U.S.A.) in 1947, for renewed attempts to simplify and standardise the nomenclature of neoplastic diseases. Following that conference, a sub-committee of several experts was appointed and was entrusted with the task to prepare and publish an Atlas on Tumor Pathology.

The main plan for the Atlas is to restrict the text to pertinent current information; give a regional account of the tumors to give the special pathology rather than the general pathology of tumors. Contributions, illustrations and text have been collected from numerous collaborators.

The tentative table of contents extends over 39 chapters, termed "fascicles", grouped under eleven sections. The various chapters (or fascicles) are to be published as and when they are ready, thus making it possible to avoid delay in publication, as well as to keep the atlas up-to-date.

Each of the several chapters is separately presented, suitable for loose-leaf binding. The subject has been dealt very ably, well-presented with numerous pictures, black-and-white as well as coloured, printed excellently in special paper —glossy on one side only for the pictures while the other side meant for text and descriptions, has a mat surface so as not to strain the eyes, each volume (fascicle) is a pleasure to read through. The Atlas will of very great help to undergraduates, and of special interest to post-graduate students and teachers.

YOUR QUESTIONS

Correspondents should give their names and addresses (not necessarily for publication) and include all relevant details in the questions which should be typed. Questions of medical interest only will be acceptable for this section. They should be sent in a separate envelope marked. "Your Questions." Questions of general interest will be published in preference. Lack of space precludes answering all the questions received.

Q. 1. What is the curative treatment of hydrophobia?

Ans. 1. There is no curative treatment.

Q. 2. A person, farmer by profession, gets allergic attacks of asthma when he comes in contact with the dust of paddy during his work with it. It is not possible for him to change his profession. What should be the procedure of treatment so that he can carry out his usual duties with paddy without getting the allergic attacks of asthma?

Ans. 2. With such definite history of allergic manifestation to inhalation of paddy husk the ideal procedure would have been to remove the patient away from the surrounding.

Preseasonal hyposensitization with specific allergen prepared from the dust containing paddy husk, to which the patient is allergic, if that be possible remains the next best procedure. Injection of such allergen should be started 12 weeks prior to the harvest month. If the specific allergen cannot be prepared, desensitization may be tried with peptone (Armour Lab, or Wilts) or with mixed inhalant solution prepared by C. L. Bencard, (Hendon, London), which may not give as satisfactory result as from hyposensitization by specific allergen.

Antihistaminic drugs orally and antihistaminic nasal drops may be used for symptomatic relief.

OBITUARY

Dr. M. U. Ahmed, M.B., L.R.C.P.S., L.R.F.P.S., D.P.H. (EDIN.), F.S.M.F. (BENGAL), Health Officer, Calcutta Corporation and an eminent member of the I.M.A., Calcutta Branch, died suddenly on 29-10-52 at about 12-30 in the night, while on special duty in connection with the Corporation drive against unlicensed "Khatals" in Calcutta.

Dr. Ahmed was appointed the Health Officer of the Calcutta Corporation in January, 1943. He was in Corporation service for more than 16 years. He was connected with various scientific bodies in Calcutta and was for years a referee for the Public Health Section of the Journal of the Indian Medical Association. Recently he had been abroad visiting America and some places on the continent.

Dr. Ahmed is survived by his wife and two minor sons. He hailed from Murshidabad, West Bengal.

XXII PUNJAB PROVINCIAL MEDICAL CONFERENCE

The 22nd Punjab Provincial Medical Conference will be held at Amritsar on the 6th and 7th of December, 1952. Dr. F. C. Shori will preside.

Members wishing to take part in the Scientific Session and firms wishing to exhibit their products in the Exhibition and to advertise in the programme are requested to write to the Provincial Secretary, Dr. Sain Das Vohra, Katra Safaid, Amritsar, at an early date.

SUPPLEMENT

Journal of the Indian Medical Association

VOL. XXII. No. 3 CALCUTTA DECEMBER, 1952

I.M.A. WORKING COMMITTEE

PROCEEDINGS OF THE 45TH MEETING HELD AT DELHI ON 23RD AND 24TH OCTOBER, 1952

[SUBJECT TO CONFIRMATION]

MEMBERS PRESENT: (*a*) *Ex-officio members*: 1. Dr. T. S. Tirumurti (Madras), President (in the chair); 2. Dr. A. K. Sen (Calcutta), Senior Vice-President; 3. Dr. S. C. Sen (New Delhi), Honorary General Secretary; 4. Dr. A. P. Mittra (New Delhi) Honorary Joint Secretary; 5. Dr. R. Sinha (Calcutta), Honorary Joint Secretary; 6. Dr. H. R. Dawar (Delhi), Honorary Treasurer; 7. Dr. P. K. Guha (Calcutta) Assistant Editor, Journal of the I.M.A. (in place of Dr. A. D. Mukharji, the Editor).

(*b*) *Representatives from the Provincial Branches*: 8. Dr. P. V. Choudhry, Andhra Provincial Branch; 9. Dr. P. C. Duarah, Assam Provincial Branch; 10. Dr. A. C. Ukil; 11. Dr. P. K. Chatterjee; 12. Dr. B. K. Ghosh (in place of Dr. B. P. Neogy); 13. Dr. Amar Paul (in place of Dr. J. Mojumdar), Bengal Provincial Branch; 16. Dr. C. S. Patel; 15. Dr. C. S. Thakkar, Bombay Provincial Branch; 16. Dr. P. N. Sinha; 17. Dr. Rajeswar Prasad, Bihar Provincial Branch; 18. Dr. J. N. Bahadur, Delhi Provincial Branch; 19. Dr. P. R. Trivedi; 20. Dr. Arvind N. Mehta, (in place of Dr. C. P. Bhat), Gujarat and Saurashtra Provincial Branch; 21. Dr. G. S. Melkote, Hyderabad Dn. Provincial Branch; 22. Dr. B. K. Vinchure, Madhya Pradesh Provincial Branch; 25. Dr. B. V. Mulay; 24. Dr. G. V. Joshi, Maharashtra and Karnatak Provincial Branch; 25. Dr. R. A. Bhagwat, Madhya Bharat Provincial Branch; 26. Dr. T. K. Dayalu, Mysore Provincial Branch; 27. Dr. F. C. Shori; 28. Dr. Sain Das Vohra, (in place of Dr. Ram Rakha Dheer), Punjab Provincial Branch; 29. Dr. D. G. Ojha, Rajputana Provincial Branch; 30. Dr. P. A. S. Raghavan; 31. Dr. K. C. Nambiar, (in place of Dr. T. V. Sivanandam); 32. Lt.-Col. T. S. Shastry, (in place of Dr. U. Krishna Rau), South Indian Provincial Branch; 33. Dr. C. O. Karunakaran, (in place of Dr. S. S. Rao), Travancore Cochin Provincial Branch; 34. Capt. H. N. Shivapuri; 35. Dr. H. Hukku; 36. Dr. S. N. Saxena, Uttar Pradesh Provincial Branch.

(*c*) *Co-opted members*: 37. Dr. Chamanlal M. Mehta, (Bombay); 38. Dr. K. Narayanamurthi, (Madras); 39. Dr. M. N. Mahadevan, (Bangalore).

(*d*) *Invited members*: 40. Dr. Ved Prakash, (New Delhi); 41. Dr. S. K. Sen, (New Delhi).

1. *CONDOLENCE RESOLUTION*:

The following condolence resolution was unanimously passed, all members standing and observing silence for one minute:—

"This meeting of the Working Committee of the Indian Medical Association places on record its deep sense of sorrow at the sad demise of the following members of the Association and conveys its heartfelt sympathy to the members of the bereaved families:—

1. Dr. Bhupal Singh (Meerut); 2. Dr. Shobha Ram (Banaras); 3. Dr. Hans Raj (Amballa Cantt.); 4. Dr. Lajpat Rai (Ludhiana); 5. Dr. Amba Prasad Saxena (Fatehgarh); 6. Dr. S. P. Srivastava (Banaras); 7. Dr. A. P. Varma (Mirzapur); 8. Dr. A. Krishnamurthy (Tinnevelly); 9. Dr. M. G. Kini (Madras), now of Bombay; 10. Dr. M. A. Nair (Madras)

2. *MESSAGES OF INABILITY TO ATTEND THE MEETING.*

Messages of inability to attend the meeting received from the following members were read:—1. Dr. S. S. Rao (Cochin); 2. Dr. T. V. Sivanandam (Coimbatore); 3. Dr. B. P. Neogy (Calcutta); Dr. J. Mojumdar (Calcutta); 5. Dr. A. D. Mukharji (Calcutta); 6. Dr. U. Krishna Rau (Madras); 7. Dr. C. P. Bhat (Bhavnagar); 8. Dr. D. V. Venkappa (Madras); 9. Dr. Ram Rakha Dheer (Jullundur City); 10. Dr. G. V. Hanumantha Rao; 11. Dr. S. Samaddar (Patna), co-opted; 12. Dr. R. A. Amesur (Bombay), co-opted.

At this stage, the President decided to appoint the following members as Tellers (Scrutineers), viz.: 1. Dr. C. O. Karunakaran (Trivandrum); 2. Dr. K. Narayanamurthi (Madras); 3. Dr. P. K. Guha (Calcutta); 4. Dr. J. N. Bahadur (New Delhi) and instructed them to start with the work of counting of votes for the election of President and 5 Vice-Presidents as under Item 14 of the Agenda, while the Committee would proceed with the other business on the Agenda.

3. *CONFIRMATION OF THE PROCEEDINGS OF THE WORKING COMMITTEE HELD AT INDORE ON 28TH AND 29TH JUNE, 1952* (as published in the October issue of the J.I.M.A.).

Dr. A. C. Ukil proposed that the Proceedings of the previous meeting of the Working Committee, as printed and circulated to the members, be duly adopted. The proposal was seconded by Dr. C. S. Patel and it was passed unanimously.

The Proceedings were duly adopted.

4. *BUSINESS ARISING OUT OF THE PROCEEDINGS OF THE LAST MEETING*:

(1) *Fee Scales for examination of Life Insurance Cases.*

Dr. Chamanlal Mehta read out the letter he had sent to the Central Office reporting on the progress made so far in the negotiations with the Indian Life Assurance Office Association. He further elaborated for the information of the House details about the discussions he had had. Dr. Mehta said that the fees paid for medical examination of Insurance cases now was at the following rates:—

Rs. 6-0-0 for cases of Rs. 2,000/- and under
Rs. 9-0-0 for cases over Rs. 2,000/- upto Rs. 5,000/-
Rs. 12-0-0 for cases over Rs. 5,000/- upto Rs. 10,000/- and Rs. 16-0-0 for cases over Rs. 10,000/-.

He had recommended in his discussion with the members of the Indian Life Assurance Office Association that these fees should at least be:

Rs. 8-0-0 for cases of Rs. 1,000/- and
Rs. 10-0-0 for cases of Rs. 1,000/- to Rs. 2,999/-.
Rs. 12-0-0 for cases of Rs. 3,000/- to Rs. 4,999/-.
Rs. 16-0-0 for cases of Rs. 5,000/- and over.

He explained that the expense ratio in the first-mentioned case came to about 6 per cent whereas in the case of second list which he had recommended, the expense ratio would go up to approximately 9 per cent and this was where the Indian Life Assurance Office Association would object. He had also discussed at the meeting under reference, point regarding the appointment of a Panel of medical examiners in each area.

According to his information, Group-Insurance-Scheme was not permissible under the present Insurance Act. He also disclosed that the whole matter was still under consideration and that further negotiations will be carried on by him with the representatives of the Indian Life Assurance Office Association.

Dr. A. C. Ukil proposed grateful thanks of the Association to Dr. Chamanlal M. Mehta for all the trouble he had

taken on this matter and for continuing negotiations on behalf of the Profession (Applause).

There was some general discussion on the subject in which several views were expressed and suggestions made—in which the following members took part:

Doctors Rajeswar Prasad, B. V. Mulay, B. K. Ghosh, K. C. Nambiar, M. N. Mahadevan, P. V. Choudhry, S. D. Vohra, S. C. Sen, F. C. Shori, P. K. Chatterjee, C. S. Patel and the President.

Dr. Chamanlal M. Mehta replied to certain questions raised during the discussion. It was also decided to request the Indian Life Assurance Office Association to appoint only members of the Indian Medical Association as their medical examiners.

(2) *System of appointment of Honorary Medical Officers.*

This item was after some discussion, again referred to the Joint Educational Scientific and Health Services Committee for report.

(3) *Health Ministers' Conference and training of village Vaidyas.*

This item was also referred to the Joint Educational Scientific and Health Services Committee for report to the Working Committee.

(4) *Indian Railways refusing to accept medical certificates by private practitioners to Railway employees.*

Dr. B. V. Mulay reported that he was still pursuing the matter and that he would convey the result of his negotiations to the Central Office in due course.

(5) *Government of India Five Year Plan*:

The action taken by the Central office in forwarding the Report of the Association to the Planning Commission, was noted. This Report had also been printed in the Journal for the information of all members of the Indian Medical Association.

(6) *Bacteriological Warfare in Korea.*

The Honorary General Secretary reported that the relevant resolution had been forwarded from the Central office to: (1) Secretary-General, U.N.O., (2) Ministry of External Affairs, Government of India, (3) Press Trust of India and United Press of India.

The action taken was noted.

(7) *Health Ministry's list of Drugs—Foreign Products with Indian Substitutes.*

Dr. A. P. Mittra, the Honorary Joint Secretary, read out the relevant correspondence and said that he had sought the advice and guidance of Dr. A. K. Sen, the senior Vice-President, who was an expert in this matter.

There was a suggestion from a member that the list supplied by the Government, Ministry of Health, be published in the Journal for opinion from the branches. Capt. Shivapuri opposed the idea and said that it would merely mean a waste of valuable space in the Journal and he thought that no branch could be able to comment on the list which had been prepared by the Government. There was some further discussion on the matter in which the following members took part:

Drs. C. S. Patel, A. K. Sen and A. C. Ukil.

It was suggested that the Editor be advised to write an editorial in the Journal on the subject.

(8) *Public Trusts Act 1950 and registration of branches of the I.M.A.*

Dr. A. P. Mittra, the Hony. Joint Secretary, read out the relevant correspondence with the Jalgaon Branch and the Maharashtra and Karnatak Provincial Branch on the subject. He also read out the opinion received from Mr. R. K. Deb, the Honorary Legal Adviser.

Dr. C. S. Patel, the President of the Bombay Provincial Branch informed the House that he was pursuing the matter with the Government of Bombay and he hoped a satisfactory solution would be arrived at in due course.

Dr. C. S. Thakkar said that the case was not hopeless and it might yet be possible to secure the requisite exemption for the I.M.A. branches in the State of Bombay from the application of the Act.

5. (a) *FORMATION OF NEW LOCAL BRANCHES*:

The formation of following new branches were approved.

Name of the local Branch	*Provincial Branch*	*Number of members*	*Date of formation*
1. Tezpur	... Assam ...	12	1- 4-52
2. Bhiwani	... Punjab ...	7	1- 4-52
3. Sonepat	... Punjab ...	7	1- 4-52
4. Samrala (Distt. Ludhiana)	... Punjab ...	6	1- 4-52
5. Chalisgaon	... M. and Karnatak	7	1-10-52
6. Malvan	... M. and Karnatak	7	1-10-52

(b) *REVIVAL OF BRANCHES.*

The following branches were revived:

1. Agra	... Uttar Pradesh	29	1- 4-52
2. Nagapatam	... South India ...	18	1- 4-52
3. Jagadhri	... Punjab ...	9	1- 4-52
4. Orai	... Uttar Pradesh	6	1- 4-52

The revival of the above branches was duly approved.

(c) *SUSPENSION OF BRANCHES.*

The following branches were recommended for suspension by their respective Provincial branches:

Name of the local Branch	*Provincial Branch*	*With effect from*
1. Rewari	... Punjab ...	1-10-52
2. Jasdan	... Gujarat and Saurashtra	1-10-52
3. Dewas	... Madhya Bharat ...	1-10-52
4. Dhar	... Madhya Bharat ...	1-10-52
5. Shajapur	... Madhya Bharat ...	1- 4-52
6. Shivpuri	... Madhya Bharat ...	1- 4-52

The above branches were declared to be suspended.

The following branch was declared "Defunct" as recommended by the Provincial Branch:

Chanda Branch under Madhya Pradesh Provincial Branch with effect from 1st April, 1952.

6. *CONSIDERATION OF C.F.C. ARREARS, IF ANY.*

Dr. A. P. Mittra, the Honorary Joint Secretary, informed the House about the position of the C.F.C. arrears in detail. He expressed the satisfaction at the position and was of the opinion that a major part of these arrears would be realized in the near future. He also mentioned that it was a matter for gratification that, perhaps, this was the first meeting of the Working Committee in so many years when there was no request from any Provincial Branch for writing off any amount of C.F.C. arrears as unrealizable. He also informed the house about the total membership strength of the Indian Medical Association which was 14,587 as on 30th September, 1952.

The House expressed its satisfaction by applause.

7. *ADOPTION OF AUDITED ACCOUNTS.*

(i) Central Office—From 1-4-52 to 30-6-52.
(ii) Journal Dept.—From 1-4-52 to 30-6-52.

The Audited accounts of the Central Office and the Journal Department, as circulated to the members, were duly approved.

8. *LETTER NO. S. 28/24282-B DATED 2-7-52 OF DEPUTY SECRETARY TO THE GOVERNMENT OF BOMBAY, LOCAL SELF-GOVERNMENT AND PUBLIC HEALTH DEPARTMENT WITH ENCLOSURES.*

Dr. A. P. Mittra, the Honorary Joint Secretary, read out the relevant letter from the Deputy Secretary to the Government of Bombay, Local Self-Government and Public Health Department, with its enclosures.

This letter was recorded.

9. *GOVERNMENT OF WEST BENGAL, MEDICAL PUBLIC HEALTH DEPT., LETTER NO. MEDL./3367/2R-10/52 DATED 5-8-52 RE. QUALIFICATIONS, STATUS AND REMUNERATION OF MEDICAL MEN IN SERVICES.*

The relevant correspondence was read out by the Honorary Joint Secretary. The Hony. Joint Secretary said that

this letter was read out as a sample for the information of the House.

Recorded.

10. *LETTER OF THE GENERAL SECRETARY, INDIAN SCIENCE CONGRESS ASSOCIATION, CALCUTTA, re. NEXT SESSION OF THE INDIAN SCIENCE CONGRESS TO BE HELD AT LUCKNOW FROM JANUARY 2 TO JANUARY 8, 1953.*

The Honorary Joint Secretary read out the relevant letter from the Indian Science Congress Association requesting the Indian Medical Association to appoint and send its Delegates to the forthcoming Session of the Indian Science Congress at Lucknow.

The House nominated Doctors H. Hukku, H. N. Shivapuri, A. C. Banerjea, T. S. Tirumurti and A. C. Ukil as Delegates to the Indian Science Congress representing the Indian Medical Association. The Honorary General Secretary was authorized to send names of other members who were willing to attend the Science Congress.

11. *LETTER NO. 142/51-52 DATED 16-7-52 OF TRAVANCORE-COCHIN PROVINCIAL BRANCH CONTAINING RESOLUTION RE. PREFERENCE TO CHILDREN OF DOCTORS FOR ADMISSION TO MEDICAL COLLEGES.*

The Honorary Joint Secretary read out the relevant letter. There was considerable discussion and it was decided that the relevant resolution could not be entertained as it was not possible to do so under the present Constitution of India.

Capt. H. N. Shivapuri mentioned that this question had been discussed in the Working Committee before and this sort of suggestion had been rejected.

After some further discussion, the House decided that further consideration of this subject be postponed. This matter should be circulated to all the Provincial Branches for eliciting their opinion and their suggestions invited as to how selections for admission to medical colleges should be made and what should be the criteria for these selections, what sort of Selection Committee should be appointed and whether any percentage of seats should be reserved for particular groups, etc., etc.

At this stage, Dr. L. N. Bauer, the President of the American Medical Association who was on a visit to India, came in and was introduced to the members by Dr. S. C. Sen, the Honorary General Secretary. Dr. Bauer addressed the members for a few minutes and conveyed the greetings of the American Medical Association to the Indian Medical Association.

The meeting then adjourned for Lunch and as the members were to attend Dr. Bauer's lecture under the auspices of the Delhi Medical Association, to be followed by an "At Home" by the Ministry of Health, Government of India, in his honour, it was decided to start the meeting again next morning (24-10-52) at 9-30 a.m.

12. *CONSIDERATION OF LETTERS RE. SOCIETY FOR INDUSTRIAL MEDICINE, INDIA.*

The relevant letter was read by Dr. S. C. Sen, the Honorary General Secretary and his reply from the Central office. The Honorary General Secretary informed the House that the correspondence was resting there and he had not heard further from the Society for the Study of Industrial Medicine, India.

The Working Committee approved of the action taken by the Honorary General Secretary and the letter was recorded.

13. *CONSIDERATION OF T.A. BILL FOR RS. 229/2 FROM DR. D. N. KHANDEKAR FOR ATTENDING THE LAST COMMONWEALTH MEDICAL CONFERENCE AT CALCUTA AS AN OBSERVER FROM MADHYA BHARAT PROVINCIAL BRANCH.*

After some discussion, the House decided with regret, that Dr. Khandekar's Bill could not be sanctioned for payment, as it was clearly decided by the W. C. at Ahmedabad that no such T. A. for Observers to the Commonwealth Medical Conference would be entertained.

14. *ELECTION OF PRESIDENT AND THREE VICE PRESIDENTS OF THE INDIAN MEDICAL ASSOCIATION FOR THE YEAR 1952-53.*

The President informed that the Tellers—Dr. C. O. Karunakarum, Dr. K. Narayanamurthi, Dr. P. K. Guha and Dr. J. N. Bahadur—had now finished the counting of the votes and he was pleased to announce the result of the Election as follows:—

Result

PRESIDENT

	Name of member	*No. of votes secured*
1.	Dr. B. V. Mulay (Sholapur)	99
2.	Dr. C. S. Patel (Bombay)	63
3.	Dr. K. Vasudeva Rao (Madras)	22
4.	Dr. A. K. Roy Chowdhury (Calcutta) ...	21
5.	Dr. (Capt.) P. B. Mukherjee (Calcutta) ...	13
6.	Dr. Rajeshwari Prasad (Arrah)	8

VICE-PRESIDENTS

1.	Dr. C. S. Thakar (Bombay)	64
2.	Dr. (Capt.) H. N. Shivapuri (Kanpur) ...	61
3.	Dr. R. V. Sathe (Bombay)	52
4.	Dr. (Miss) M. P. John (Patna)	34
5.	Dr. D. V. Venkappa (Madras)	33
6.	Dr. M. G. Shah (Bombay)	31
7.	Dr. U. B. Narayana Rao (Bombay) ...	28
8.	Dr. A. C. Ukil (Calcutta)	28
9.	Dr. S. Samaddar (Patna)	27
10.	Dr. H. L. Vaidya (Bhabnagar)	23
11.	Dr. S. K. Mukherjee (Indore)	19
12.	Dr. Govindan Nair (Madras)	18
13.	Dr. (Capt.) P. B. Mukherjee (Calcutta) ...	17
14.	Dr. K. K. Sen Gupta (Calcutta)	17
15.	Dr. P. S. Gupta (Nasik)	16
16.	Dr. Lt.-Col. T. S. Shastry (Madras) ...	16
17.	Dr. K. Narayana Murthi (Madras) ...	15
18.	Dr. S. K. Ghosh Dastidar (Patna) ...	14
19.	Dr. D. Ram (Patna)	13
20.	Dr. (Capt.) R. C. Goulatia (New Delhi) ...	13
21.	Dr. Bhubaneshwar Barua (Gauhati) ...	13
22.	Dr. B. L. Kapur (Ludhiana)	10
23.	Dr. B. K. Ghosh (Barrackpore)	10
24.	Dr. Ram Rakha Dhir (Jullundur)	9
25.	Dr. V. B. Davalbhakta (Jalgaon)	7
26.	Dr. F. C. Shori (Amritsar)	6
27.	Dr. S. C. Vinayak (Ferozepur)	5
28.	Dr. S. N. Kurdikar (Dharwar)	4
29.	Dr. Isac Santra (Sambalpur)	4
30.	Dr. B. C. Bose (Indore)	4
31.	Dr. V. N. Rande (Kolhapur)	4
32.	Dr. P. B. Bhadre (Kolhapur)	4
33.	Dr. (Lt.-Col.) K. S. R. Swami (Gaya) ...	3
34.	Dr. R. C. Sondhi (Ambala City)	3
35.	Dr. (Capt.) N. N. Ghosh (Jharia)	3
36.	Dr. A. N. Ghosh (Kankurgachi)	3
37.	Dr. K. N. Mishra (Cuttack)	3
38.	Dr. R. Mohanti (Cuttack)	2
39.	Dr. A. M. Deva (Ambala Cantt.)	2
40.	Dr. Sudhir Nath Sen (Monghyr)	2
41.	Dr. S. K. Bhattacharya (Kooch-Behar) ...	1
42.	Dr. S. C. Patanayak (Berhampur) ...	1
Total Number of Ballot Papers received ...		247
Ballot papers made invalid by the office ...		13
Ballot papers made invalid by the Tellers ...		7
No. of ballot papers declared VALID ...		227

The President, Dr. T. S. Tirumurti, then declared the following elected:—

PRESIDENT

Dr. B. V. Mulay (Sholapur).

3 *VICE-PRESIDENTS*

1. Dr. C. S. Thakar (Bombay), Senior.
2. Dr. (Capt.) H. N. Shivapuri, (Kanpur).
3. Dr. R. V. Sathe (Bombay).

The House passed a vote of thanks to the Tellers.

15. *CONSIDERATION OF LETTER NO. 2457 DATED 21-8-52 OF S. VAIDYA NATH AIYAR AND COMPANY,*

CHARTERED ACCOUNTANTS AND AUDITORS RE. RE-ORGANIZATION OF THE FIRM BY DISSOLUTION, ETC.

The letter from the Honorary Auditors was considered and the Working Committee was pleased to appoint the firm M/s Khanna and Annadhanam, Chartered Accountants, 4, Kashmere Gate, Delhi, as the Honorary Auditors of the Central Office of the Association for the interim period till next Elections took place at the Annual Meeting of the Central Council.

16. *INTERNSHIPS AND RESIDENCIES ABROAD.*

(i) Latest Position.
(ii) Extracts from Reports of work received from selected candidates sent abroad.

Dr. S. C. Sen, the Honorary General Secretary, spoke at length and gave details regarding post-graduate students who had been sent abroad for Internships and Residencies. The total number of students for whom appointments had been secured and who had already taken up duties since the Selection Committee met last was 46. He also informed the House about the details of opinions of our students who had been asked to write and tell about their experiences. He was pleased to say that in most cases, our students were happy and contented with their jobs and that they were having useful training.

He then asked the House about the date and the venue for the meeting of the Selection Committee for interviewing the new candidates for the next year. The House nominated the President, Dr. T. S. Tirimurti, the incoming President, Dr. B. V. Mulay and the Honorary General Secretary, Dr. S. C. Sen, as members of the Selection Committee. The date and venue for the meeting of the Selection Committee was to be decided upon by the President and the Honorary General Secretary in consultation.

There were some questions asked by a few members regarding the internship appointments abroad and Dr. Sen gave the necessary information.

The W. C. entrusted the selection of Grangegorman Mental Hospital to Drs. S. C. Sen and A. P. Mittra.

17. *CONSIDERATION OF THIS OFFICE LETTER NO. 5003/51-52 DATED 9-6-52 AND LETTER NO. 19 DATED 19-6-52 OF THE MAHARASHTRA AND KARNATAK PROVINCIAL BRANCH RE. C.F.C. OF DR. JOTWNI, A MEMBER OF JALGAON BRANCH (M. AND KARNATAK).*

The letter regarding a member of the Jalgaon Branch and his C.F.C. was considered along with relevant correspondence between Maharashtra and Karnatak Provincial Branch and the Central Office.

There was considerable discussion in which Drs. S. C. Sen, A. P. Mittra, B. V. Mulay, H. N. Shivapuri, A. K. Sen, P. K. Chatterjee and G. V. Joshi took part.

The House came to the conclusion that the Rules of the Maharashtra and Karnatak Provincial Branch were not conflicting with the Rules of the Indian Medical Association and also that according to the Rules, a Provincial Branch was autonomous; it could collect the C.F.C. for the whole year if it was laid down in its rules. The Central Office, however, could forego the C.F.C. for the 2nd half year for an old member if he happened to resign before the end of the first half.

There was also some discussion about the present procedure for collecting the C.F.C. in two instalments and the Working Committee confirmed that it be continued.

18. *LETTERS FROM THE CONVENER, ANTI-SPURIOUS DRUGS COMMITTEE AND RESOLUTIONS PASSED BY IT, AND LETTER DATED 27-8-52 FROM A MEMBER OF SHIMOGA BRANCH RE. MANUFACTURE AND SALE OF SPURIOUS DRUGS AND GOVERNMENT TO CHECK THE PREVALENCE OF SUCH DRUGS.*

Dr. A. P. Mittra, the Honorary Joint Secretary, read out the letters and the resolutions he had received from the Convener, of the Anti-spurious Drug Committee which had been formed in Calcutta. He also read out a letter on the same subject from a member of Shimoga Branch.

There was considerable general discussion in which the following members took part:—

Drs. A. K. Sen, H. N. Shivapuri, C. S. Patel, P. K. Chatterjee, B. K. Ghosh, S. D. Vohra, F. C. Shori, C. L. Mehta, K. C. Nambiar, M. N. Mahadevan and S. C. Sen.

The House decided that since the Anti-Spurious Drug Committee had taken all necessary action, passed comprehensive resolutions and had forwarded them to the authorities concerned who also had promised to take suitable steps for the suppression of illegal activities by spurious drugs manufacturers and sellers, there was no further action necessary from the Indian Medical Association just at the present and it approved of the move.

Dr. S. C. Sen, however, said that while the Indian Medical Association supported the spirit behind the action of the Anti-Spurious Drug Committee, he thought that this Association also should be active and study the amendments to the Drugs Bill—which were to be brought up in the State Assemblies and Parliament and make suitable recommendations.

Dr. C. S. Patel approved of Dr. Sen's suggestions and proposed that a Sub-Committee be appointed to study the matter and prepare a Report.

The following were duly nominated as members of a Sub-Committee to study the spurious drug trade:—

1. Dr. A. K. Sen (Calcutta), the Convener.
2. Dr. B. V. Mulay (Sholapur).
3. Dr. T. S. Tirumurti (Madras).
4. Dr. H. N. Shivapuri (Kanpur).
5. Dr. M. N. Mahadevan (Bangalore).
6. Dr. S. C. Sen (New Delhi).
7. Dr. A. P. Mittra (New Delhi).

19. *LETTER NO. — DATED 18-9-52 OF THE BOMBAY PROVINCIAL BRANCH AND NO. 948/51-52 DATED 22-9-52 OF THE BENGAL PROVINCIAL BRANCH RE. DECISION OF THE WORKING COMMITTEE TO DONATE THE AMOUNTS RECEIVED FROM THE B.M.A. BRANCHES TO THE I.M.A. "BUILDING FUND."*

Dr. S. C. Sen, the Honorary General Secretary, informed the House that some of the Provincial Branches have already received the assets of the B.M.A. Branches in their respective areas which have now been dissolved. The resolution of the Working Committee requesting the Provincial Branches to donate the amounts of moneys thus received, to the I.M.A. Building Fund, had been transmitted to all branches (Provincial) from the Central Office in due course. So far the Bombay Provincial Branch and the Bengal Provincial Branch have both regretted their inability to donate the amounts they had received, as the former branch wished to start a Fund with this amount as the nucleus for a building of their own at Bombay; and the latter wanted to utilize the money for their Provincial Organization and for their Rural Medical Conference programme.

It was decided that these two branches (and other branches if the need arose) be requested again by the Honorary General Secretary to re-consider the matter and donate the relevant amounts for the Central I.M.A. Building Fund.

20. *AUTHENTICATION OF INTERNATIONAL CERTIFICATES FOR VACCINATION AND INOCULATION.*

The Honorary General Secretary explained the whole position as to how the Government of India were willing to issue about 75 or 100 authentication Seals to the nominees of the Indian Medical Association at Key places where International Vaccination Certificates were largely issued. There was some discussion and the view expressed by most of the members was that on principle the privilege should be given to all Presidents and Honorary Secretaries of all local branches and that the Honorary General Secretary should try once again to convince Government on this point. If, however, this was not possible, then the Honorary General Secretary was authorized to recommend a list of branch Presidents and branch Secretaries of Key towns and cities on a priority basis for the purpose.

21. *ANY OTHER BUSINESS WITH THE PERMISSION OF THE PRPESIDENT.*

(a) *Dates for the next meeting of the Working Committee, the annual meeting of the Central Council and the Conference.*

The dates for the next meeting of the Working Committee, the Annual Meeting of the Central Council and the Conference were again confirmed as passed at the last meeting of the Committee at Indore.

(b) *Resolution of Dr. C. O. Karunakaran*: The following resolution was moved by Dr. C. O. Karunakaran and was seconded by Capt. H. N. Shivapuri:—

'The Working Committee of the Indian Medical Association views with grave concern the proposal of the Madras Government to institute a medical course of three years' duration, as it would defeat the policy of upgrading of medical education accepted by the Government of India and the Indian Medical Council after prolonged and careful consideration.

The Working Committee further resolves to request the Central Government to see that the standard of medical education is not allowed to fall below the minimum now prescribed by the Indian Medical Council, i.e., M.B., B.S. degree—either by reducing the course or by adulteration in Modern Medicine with instruction in other Systems of Medicine.''

The resolution was passed unanimously.

(c) *Employees State Insurance Scheme*: There were requests from three Provincial Branches viz., Bengal, Bombay and Punjab for a discussion and guidance by the Working Committee on the Scheme, which was to be implemented shortly in these three States on the basis of panel system. The chief point which was worrying the Provincial Branches was that of the rate of payment to the panel doctor. In Bombay and Punjab the rate which the Employees State Insurance Corporation was offering (approximately Rs. 4/- per annum per patient) was considered too low as it was for all expenses including professional Service and cost of ordinary medicines.

Dr. S. C. Sen informed the house about the report of the Employees' State Insurance Corporation's working expenses in Delhi for the past few months. From this it was found that the Corporation's administrative expenses were approximately Rs. 8/- per registered worker.

There was considerable general discussion and it was the majority view that at least Rs. 8/- per capita should be paid to the Doctor and on this basis, the scheme should be worked by the medical profession for a few months or a year and then review the matter. The Provincial Branches could proceed with further negotiations with the Employees' State Insurance Corporation in their respective places according to the local needs and standards of expense.

The following members took part in the discussion:

Doctors Chamanlal M. Mehta, C. S. Thakkar, F. C. Shori, A. K. Sen, H. N. Shivapuri, S. C. Sen and A. P. Mittra.

(d) *Letter of Dr. M. N. Mahadevan re. recognition of the Mysore M.B.B.S. Degree by the G.M.C. of U.K.*

A letter from Dr. M. N. Mahadevan requesting the Indian Medical Association to take necessary steps for the recognition of the Mysore M.B.B.S. Degree by the General Medical Council of U.K. was considered. Dr. Mahadevan spoke explaining the situation.

It was decided to move the Medical Council of India on the subject.

(e) *Letter from the Mysore Provincial Branch inviting Working Committee to hold one meeting at Bangalore during the next year.*

A letter from the Mysore Provincial Branch inviting the Working Committee to hold one meeting at Bangalore during the next year was read out. The Committee recorded its thanks and appreciation for the invitation and decided that this invitation might be kept in view by the President while fixing the venues for the meetings of the Committee.

(f) *Sanction of expenses incurred by the President and Honorary Joint Secretary at Madras.*

The Honorary General Secretary was authorized to pay the bill for certain office expenses which had been incurred by the President and the Honorary Joint Secretary at Madras.

(g) *Application for a grant Rs. 5,000/- from the Bengal Provincial Medical Relief Committee.*

An application for a grant of Rs. 5,000/- from the Bengal Medical Relief Committee was considered; this amount was intended to be spent in connexion with medical relief to displaced persons who were arriving in large numbers from East Pakistan as a result of the recent renewed exodus.

After some discussion as to how the amount should be and was going to be spent, the following resolution was passed as moved by Dr. C. S. Thakar and seconded by Dr. F. C. Shori:—

"Resolved that a sum of Rs. 1,000/- be paid to the Bengal Provincial Branch to be suitably spent by the branch for the medical relief of displaced persons. This amount was to be paid from the Distress Relief Fund of the Central Office with a request to the Bengal Provincial Branch to send an account of the expenditure of this amount in due course."

(h) *Operating of Central Accounts.* The Committee authorized the Honorary General Secretary to continue operating the Central Accounts and make the usual necessary payments pending the passing of the budget at the annual meeting of the Central Council in December.

(i) *Sanction of money for meeting the incidental expenses in connection with visits to Delhi of distinguished members of National Medical Associations of other countries.*

The Honorary General Secretary asked the house to consider sanctioning some money for meeting the expenses in entertaining and for other incidental expenses in connexion with visits to Delhi of distinguished members of National Medical Associations of other countries. The Committee discussed the matter and authorised the Honorary General Secretary to spend upto Rs. 1,000/- for the purpose when need be. This amount was to be budgeted and sanction obtained at the Annual meeting of the Central Council.

(j) *Resolution of Dr. K. C. Nambiar*: Dr. Nambiar moved the following resolution:

"Resolved to request the Government of India through D.M.S., Madras, that the Honorary Medical Officers (Civil Surgeon rank), of the Madras State may be allowed to give certificates of physical fitness to the Central Government recruits in the same manner as paid Civil Surgeons".

It was seconded by Dr. K. Narayanmurthi.

The resolution was passed.

22. Dr. B. V. Mulay, the President-elect was asked by the President to speak a few words to members present who were all very happy at the result of the election and heartily congratulated him.

Dr. Mulay addressed the house for a few minutes in suitable words.

23. The following resolutions were moved from the chair and passed unanimously:—

1. This meeting of the Working Committee of the Indian Medical Association places on record its deep appreciation and thanks for the hospitality and courtesy accorded to its members on the occasion of the meeting held at Delhi on 23rd and 24th October, 1952, by the Delhi Medical Association and offers its grateful thanks to the Delhi Medical Association for permission to hold the meeting in their Hall.

2. This meeting also offers its grateful thanks to the Delhi Medical Association for inviting the Working Committee members to its Annual Dinner and to the lecture-meeting of Dr. L. H. Bauer, the President of the American Medical Association.

3. This meeting of the Working Committee also offers its grateful thanks to the Director-General of Health Service, Government of India, for inviting its members at the "AT HOME" held in honour of Dr. L. H. Bauer, the President of the American Medical Association.

With a vote of thanks to the chair, the meeting terminated.

S. C. SEN,
Honorary General Secretary.

T. S. TIRUMURTI,
President.

BRANCH NOTES

ANAMALLAI BRANCH—On the second anniversary of the branch on April 27, 1952, it was formed as a separate branch of the I.M.A., with Dr. P. Dharmapal as president and Dr. K. John as secretary. Since then, five meetings were held in which the following subjects were discussed, (1) Plantation Medical Practice by Dr. S. Dorai Raj (2) Antibiotics by Dr. M. K. R. Jayachandran (3) Malignant Malnutrition by Dr. P. G. George (4) Obstetric Shock by Dr. Gopalswamy (5) Redness of the Eye by Dr. S. P. Subramanian.

ANANTAPUR DISTRICT BRANCH—The annual general meeting of the branch was held on 25-10-52. Dr. K. Rajamannar presided. There was a demonstration of Yogic Asanas by Sri K. Venkatasubha Rao. Office-bearers for 1952-53 were elected with Dr. K. Rajamannar as president and Dr. V. K. Rajaram Rao as secretary.

ASANSOL BRANCH—A meeting of the branch was held on 20-7-52 with Dr. B. Gupta in the chair. It was proposed to hold a local conference, the actual date of which to be fixed in a subsequent meeting.

BELLARY BRANCH—During the year 1951-52, the following clinical subjects were discussed in the monthly meetings:

(1) Tumor Testis and Lump in Abdomen by Lt.-Col. R. K. Chettur, (2) Gangrene Foot by Dr. M. P. Sarma, (3) Aortic Regurgitation by Dr. M. S. Radhakrishna Naidu. (4) Peripheral Neuritis by Dr. M. S. Radhakrishna Naidu, (5) Neurasthenia by Dr. M. S. Radhakrishna Naidu, (6) Stone in the Kidney by Dr. M. P. Sarma, (7) Blood Bank and its utility to people by Dr. T. Raghavan of King's Institute. Guindy, (8) Infantile Convulsions by Dr. M. S. Radhakrishna Naidu, (9) Macrocytic Anæmias and blood transfusion by Dr. M. S. Radhakrishna Naidu, (10) Abscess Lung by Dr. M. S. Radhakrishna Naidu, (11) Pleurisy with Effusion by Dr. M. S. Radhakrishna Naidu, (12) Tape Worm Infection by Dr. M. S. Radhakrishna Naidu, (13) Tumor Liver by Dr. A. Suryanarayan, (14) Mycetoma Hand by Dr. A. Suryanarayana, (15) Abscess in Ileocæcal Region by Dr. M. P. Sarma, (16) Malignant Sarcoma near shoulder with Ascitis by Dr. B. Janab Rao, (17) Actinomycosis by Dr. B. Janabrao, (18) A typical perforation of gastric ulcer with peritonitis by Dr. Janab Rao, (19) Pylorospasm due to Appendical infection by Dr. B. Janab Rao, (20) Intussusception in a woman mistaken for amœbic dysentery and Hepatic Abscess by Major A. Thimmappayya, (21) Gastric Hernia with T. B. by Lt.-Col. R. K. Chettur, (22) Ectopic Vesicæ with Hydrocele of cord by Lt.-Col. R. K. Chettur, (23) Congenital abscence of Radius in forearm by Lt.-Col. Chettur, (24) Stone in gall bladder by Lt.-Col. R. K. Chettur, (26) Cirrhosis liver treated by Itraheptal by Dr. G. Sreenivasmurthy.

BERHAMPUR (GANJAM)—A meeting of the branch was held on 12-9-52. The secretary was requested to negotiate with the municipality for a reading room for the branch. The introduction of "cheap and efficient" medical aid to rural areas, proposed by the Madras State was disapproved. This branch also vehemently opposed the proposal brought by the Orissa Council of Medical Registration regarding the renewal of registration fee every year by the registered medical practitioners.

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In another meeting of the branch held on 15-10-52, Dr. B. Mukherjee spoke on his "Impressions on Tuberculosis in foreign countries".

BHAVNAGAR BRANCH—The annual meeting of the branch was held on 11-10-52. Dr. K. V. Thakkar was elected the President and Drs. Arvind Mehta and J. S. Shah, the joint secretaries for the year 1952-53.

BONGAON BRANCH—To arrange free treatment of the refugees who were coming in large numbers due to the proposed introduction of passport, the branch opened a medical camp at Bongaon. Sri A. P. Jain, Sri A. K. Chanda of the Union Government and Sri B. K. Acheryya, the Dy. High Commissioner for India in Dacca, paid visits to the camp and appreciated the relief work done.

BOKARO BRANCH—The annual general meeting of the branch was held on 26-10-52. Dr. P. R. Bhattacharya presided. Office-bearers for the year 1952-53 were elected with Dr. P. R. Bhattacharya as president and Dr. R. N. Roy as secretary.

CACHAR BRANCH—The annual meeting of the branch was held on 20-9-52. Twenty members were present. Dr. S. C. Gupta presided. Office-bearers were elected with Dr. S. C. Gupta as president and Dr. S. P. Nath as secretary for the year 1952-53. The annual report of the branch shows that nine meetings were held during the year. Scientific discussions were held in each of these meetings. There were 33 members at the beginning of the year but the year closed with 31 members.

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A meeting of the branch was held on 25-10-52. Dr. D. N. Chakravorty was in the chair. Dr. S. M. Paul read a paper on "Blackwater Fever" which was followed by discussions.

CHETTINAD BRANCH—A meeting of the branch was held on 26-10-52 with Dr. S. Subramaniam in the chair. Dr. T. S. Shetty spoke about the prevalence of Diphtheria and its seasonal incidence. Dr. S. Subramaniam read an interesting case report of a full term Vesicular mole for which a caesarian section was done, and 3 case records of Rupture of Uterus. There was also a film show on "Intravenous Anæsthesia."

DEHRA DUN BRANCH—The members of the branch met at a special meeting on 11-10-52 to record the sad and most untimely death of Dr. T. S. Shukla, the president of the branch and sent a message of heartfelt sympathy to his wife and other members of the bereaved family.

DOOARS BRANCH—The 12th annual general meeting of the branch was held on 16-3-52 with Dr. G. N. De in the chair. Fifty-one members were present. The annual report of the branch from March, 1951, to February, 1952, shows an increase in membership from 151 to 163. The members held four meetings of the Executive Committee, two meetings of the sub-district secretaries and one meeting of the memorandum sub-committee during the period under review. The meetings were generally well attended.

FAIZABAD BRANCH—The annual meeting of the branch was held on 5-10-52. Office-bearers for 1952-53 were elected with Dr. Pratap Bahadur as president and Dr. Yag Datta Kapur as secretary. The annual report of 1951-52 shows that 12 meetings were held during the year and scientific subjects were discussed.

FEROZEPORE BRANCH—An extraordinary meeting of the branch was held on 12-9-52 with Dr. Raja Ram Bhola in the chair. Nineteen members attended. Col. R. N. Khosla spoke on the organisation of Family Planning Clinic.

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An extraordinary meeting was held on 21-9-52. Dr. Raja Ram Bhola presided. Twenty members were present. Dr. Karan Singh Grewal read a paper on "Brachalgia and painful arm".

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The annual meeting of the branch was held on 14-10-52. Dr. Raja Ram Bhola presided. Ten members were present. The annual report was presented. Dr. Raja Ram Bhola was elected the president and Dr. D. S. Bhalla secretary of the branch, for the year 1952-53.

GADAG BRANCH—The annual meeting of the branch was held on 16-10-52. Dr. D. V. Chafekar was in the chair. Office-bearers for 1952-53 were elected with Dr. D. V. Chafekar as president and Dr. G. S. Kulkarni as secretary.

GHUGUDANGA BRANCH—The annual general meeting of the branch was held on 26-10-52 with Dr. Sarat Sashi Sarkar in the chair. Twenty members were present. The accounts for 1951-52 were passed. Office-bearers were elected for the year 1952-53, with Dr. Sarat Sashi Sarkar as president and Dr. Sib Ch. Sen Gupta as secretary. Dr. M. L. Chatterjee read a paper on Management of Joints and bone injuries in

general practice. The anual report for 1951-52 shows that the branch held ten monthly meetings and one executive committee meeting during the year. The membership strength was thirty-five. The branch took a leading part in opening an outdoor chest clinic in the locality with the co-operation of the Cossipore Social Service Corps.

GIRIDIH BRANCH—The annual general meeting of the branch was held on 5-10-52. Dr. H. C. Chatterjee presided. Office-bearers for 1952-53 were elected with Dr. H. C. Chatterjee as president and Dr. B. Ghosh as secretary.

HYDERABAD LOCAL BRANCH—The annual meeting of the branch was held on 5-10-52. Dr. (Mrs.) Shanta Bai Satawalekar was elected the president and Dr. B. K. Naik, the secretary for the year 1952-53.

JALGAON BRANCH—An extraordinary meeting of the branch was held on 26-10-52 to condole the sad death of Dr. Krishnaji Shankar Dunakhe, a founder member and ex-president of the branch. A resolution was passed and a copy of it was forwarded to the bereaved family.

JAGATDAL BRANCH—A meeting of the branch was held on 21-10-52. Messrs. Grimaults Laboratory Ltd. gave a film demonstration on (1) Management of Failing Heart (2) Surgical treatment of Aortic Embolism and (3) Four Seasons of France.

JAGATDAL BRANCH—During the year 1951-52, five executive committee meetings were held in addition to the usual monthly meetings. One special meeting and six clinical meetings were held. Four members of this branch attended the refresher course organised by the Bengal Provincial Branch.

K. G. F. LOCAL BRANCH—A meeting of the branch was held on 25-10-52 with Dr. J. C. Jeffrey in the chair. Dr. A. Krishna Rao spoke on "The Problem of Tonsils and Adenoids". Dr. K. S. Nanjundaiah read a paper on "Malaria Immunity" and Dr. P. Channabasappa demonstrated a case of "Childhood Hemiplegia". Twenty-six members were present.

KOTALPUR BRANCH—The annual general meeting of the branch was held on 14-10-52. Dr. Mohini Mohan Roy was elected the president and Drs. Saroj Kumar Chatterjee and Madan Mohan Karmakar, joint secretaries for the year. Report on the draft rules submitted by the sub-committee was considered and accepted.

LUDHIANA BRANCH—The annual meeting of the branch was held on 21-9-52. Dr. Sham Singh Satija was elected the president and Dr. Mulkh Raj Tuli, the secretary for the year 1952-53. Last year's annual report shows that the branch held 22 meetings during the year. Scientific discussions were also held in some of these meetings.

MANDYA BRANCH—A meeting of the executive committee of the branch was held on 4-10-52. Five members were present. It was resolved to send an appeal to all medical men of the district to enrol themselves as members of the association.

MADHUPUR BRANCH—A meeting was held on 19-10-52 to condole the sad and sudden death of Dr. H. K. Chatterjee, an active member of the association. The copy of the resolution was sent to the bereaved family.

MEERUT BRANCH—The annual report of the branch for the year 1951-52 shows that nine executive committee meetings and fourteen general meetings were held during the year. Clinical subjects were read and discussed in some of the meetings. One special meeting was held to unveil the portrait of late Dr. Bupal Singh. A Committee was formed to give effect to the construction of a suitable memorial to be named "Bhupal Singh medical memorial." The membership position was unchanged.

MIRAJ BRANCH—The annual meeting of the branch was held on 6-10-52. Office-bearers for 1952-53 were elected with Dr. S. D. Arawattigi as president and Dr. M. S. Karandikar as secretary.

Dr. D. P. Gorde narrated some of his interesting experiences of his study tour in America. He was given an address of welcome.

MORVI MEDICAL UNION—A party was organised by the branch to congratulate Dr. Jayantilal N. Parekh on his being elected to the House of People from Zalawod-Morvi-Malia constituency.

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A meeting of the branch was held on 30-9-52 with Dr. D. C. Oza in the chair. Dr. J. N. Parekh was elected the president of Dr. S. L. Munshi, the secretary for 1952-53. Twelve members were present. Dr. P. D. Sonagra read a paper on Antimalarials.

MORADABAD BRANCH—The annual meeting of the branch was held on 21-10-52. After the annual report was read, a symposium of Enteric group of fever was taken up. Office-bearers for 1952-53 were elected with Dr. A. K. Bhattacharya as president and Dr. J. S. Rastogi as secretary.

NABADWIP BRANCH—The annual general meeting of the branch was held on 7-10-52. Sixteen members were present. Office-bearers for the year 1952-53 were elected with Dr. Monilal Kundu as president and Dr. Ajit Nath Maitra as secretary.

POONA BRANCH—The annual report of the branch shows that the Managing Committee met eight times and the general body eighteen times during the year. Twenty scientific papers were read and discussed and various films were also exhibited. Membership increased from 190 to 220.

PORBANDAR BRANCH—A clinical meeting of the branch was held on 26-10-52 with Dr. H. H. Chavda in the chair. Twenty-four members were present. Dr. M. M. Nanawati read his paper on "Ketosis and Acidosis". Dr. Chanda discussed the treatment aspect of it. Dr. C. V. Mankad read his case report "A Tumour in connection with small Intestine" and Dr. H. H. Chanda read his paper on "Proper use of Iron Liver Extract, Folic Acid and B_{12}.

PUNJAB STATE BRANCH—In a meeting of the Provincial State Council held on 12-0-52, the Council placed on record its deep sense of grief and sorrow at the sad and untimely death of Dr. Hans Raj and offered sincerest condolence to the relatives of the deceased.

SHIMOGA BRANCH—A meeting of the branch was held on 11-10-52 with Dr. K. Sripathi Rao in the chair. The following subjects were discussed. (1) Spondylitis Deformens by Dr. T. N. Srinivasiah (2) Demonstration of a case of "Hereditary Hæmorrhagic Telangiectasis" by Dr. D. Krishna Murthy (3) "Some Aspects of Diabetes" by Dr. T. Prasannasimha Rao.

SOUTH ARCOT BRANCH—The annual meeting of the branch was held on 30-9-52. Office-bearers for 1952-53 were elected with Dr. S. Soundararajan as president and Drs. N. D. Ramaswamy and N. Ramachandran as secretaries. Dr. K. S. Sanjeevi, Professor of Medicine, Medical College, Madras, spoke on Common Medical Problems in South India.

A meeting of the branch was held on 25-10-52 with Dr. S. Soundara Rajan in the chair. Dr. N. Santeshan of Santosh Memorial Tuberculosis Sanatorium, spoke on the "Drug Treatment of Tuberculosis".

SURAT MEDICAL UNION—In the annual meeting, office-bearers were elected with Dr. M. K. Dixit as president and Dr. K. H. Haradhwala as secretary. The annual report shows that the branch held 5 clinical meetings during the year 1951-52, when interesting clinical subjects were discussed.

TINSUKIA BRANCH—The annual meeting of the branch was held on 5-10-52 with Dr. D. C. Chakraborty in the chair. Office-bearers for the year 1952-53 were elected with Dr. D. C. Chakraborty as president and Dr. K. L. Sen Sarmah as secretary. The report shows that there were seven general meetings during the year and scientific discussions were held after every meeting as a routine.

XXIX ALL-INDIA MEDICAL CONFERENCE, PATNA

The twenty-ninth session of the All-India Medical Conference will be held at Patna this year on the 26th, 27th and 28th December.

Patna is a city of historic importance. It was the capital seat of the Great Magadh Empire nearly 2,500 years ago and was then known by the name of Pataliputra. It is situated on the bank of river Ganges and is at present the capital city of the State of Bihar.

Patna has many important places worth visiting, viz.: (1) Patna Museum, (2) Golghar (constructed in 1786, ninety-eight feet high, the walls twelve feet thick), (3) Kumhrar Excavation (the palace of Chandra Gupta the Maurya was probably situated here), (4) Agam Kuan (believed to be existing from the time of King Asoka), (5) Hara Mandir (Guru Govind Singh was born here in 1664 A.D.) and (6) Patan Devi, an ancient Shrine.

Other important places near Patna which are of historic importance and which will interest the visitors, are (1) *Rajgir*: about sixty-four miles from Patna having a series of constantly sprouting hot springs supposed to have efficacious medicinal value. (2) *Nalanda*: sixty miles from Patna, a great seat of learning in ancient India and a centre of Buddhist culture during the 5th to 7th century A.D. (3) *Bodh Gaya*: the place where Lord Buddha got "Nirvana". It lies about 57 miles from Patna by train to Gaya and 8 miles by road from Gaya to Bodh Gaya. (4) *Kodarma*: about 105 miles south of Patna and is the largest seat of mica mines in India. (5) *Pawapuri*: About 60 miles from Patna, is one of the religious places of the Jains with a beautiful temple and lake. (6) *Vaisali*: 20 miles to the north of river Ganga, a seat of ancient culture. It was famous for its republican Government of Lichhavis in ancient times.

DETAILED PROGRAMME OF THE CONFERENCE

21st December, 1952

10 A.M. to 1 P.M.	... Working Committee meeting of I.M.A.
1 P.M. to 2 P.M.	... Interval for Lunch
2 P.M. to 4-30 P.M.	... Working Committee meeting of I.M.A.
4-30 P.M. to 5-30 P.M.	... Interval for afternoon tea
5-30 P.M. to 8-30 P.M.	... Working Committee meeting of I.M.A.

22nd December, 1952

12 Noon to 1 P.M.	... Working Committee meeting of I.M.A.
1 P.M. to 2 P.M.	... Interval for Lunch
2 P.M. to 4 P.M.	... Working Committee meeting of I.M.A.
4 P.M. to 5 P.M.	... Interval for afternoon tea
5 P.M. to 8-30 P.M.	... Working Committee meeting of I.M.A.

23rd December, 1952

10 A.M. to 1 P.M.	... Central Council Meeting of I.M.A.
1 P.M. to 2-30 P.M.	... Interval for Lunch
2-30 P.M. to 4-30 P.M.	... Central Council Meeting of I.M.A.
4-30 P.M. to 5-30 P.M.	... Interval for afternoon tea
5-30 P.M. to 7 P.M.	... Central Council Meeting of I.M.A.
7 P.M. to 9 P.M.	... Entertainment

24th December, 1952

9 A.M. to 1 P.M. 2-30 P.M. to 4-30 P.M. 5 P.M. to 9 P.M.	... Central Council Meeting of I.M.A.

25th December, 1952 — Central Council Meeting Entertainment and Excursion

26th December, 1952

10 A.M. to 1-30 P.M.	... 1. Inauguration of the Conference
	... 2. Election of members of Subjects Committee
	... 3. Opening of the Exhibition
1-30 P.M. to 2-30 P.M.	... Interval for Lunch
2-30 P.M. to 4-30 P.M.	... Inauguration of Scientific session followed by papers.
4-30 P.M. to 5-30 P.M.	... Interval for Tea
5-30 P.M. to 6-30 P.M.	Popular Lecture Session
7 P.M. to 8-30 P.M.	... Scientific Symposium
8-30 P.M. to 9-30 P.M.	... Dinner
9-30 P.M. to 11-30 P.M.	... Entertainment and Subjects Committee

27th December, 1952

9 A.M. to 12 Noon	... 1. Subjects Committee.
	... 2. Scientific papers
	... 3. Health films
2 P.M. to 4-30 P.M.	... Open Session
5 P.M. to 6-30 P.M.	... Popular Lecture
7 P.M. to 8-30 P.M.	... Symposium
8-30 P.M.	... Reception Committee Dinner
10 P.M.	... Subjects Committee.

28th December, 1952

9 A.M. to 10 A.M.	... Open Session if necessary
10 A.M. to 12 Noon	... Scientific papers
12 Noon to 1 P.M.	... Central Council meeting (under the new President)
2-30 P.M. to 4-30 P.M.	... Symposium
5 P.M. to 6-30 P.M.	... Popular Lecture
7 P.M. to 9 P.M.	... Entertainment

29th December, 1952 ... Excursion

Members are requested to inform the Reception Committee office, Bari Road, Patna 4, the time of their arrival at Patna Junction (not Patna city) or Mahendra Ghat or Patna Aerodrome as the case may be, earlier. This will help the Reception Committee to make necessary arrangements.

December is cool at Patna and visitors are requested to bring proper warm clothing, full bedding and mosquito nets.

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- Ferri et Quinine Citras B. P. C.
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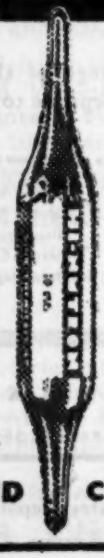

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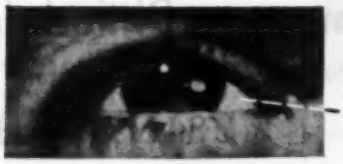

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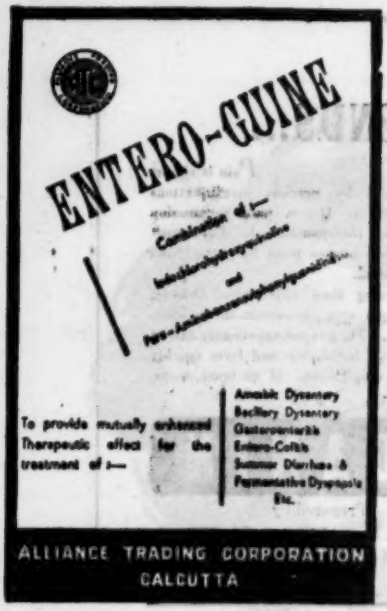

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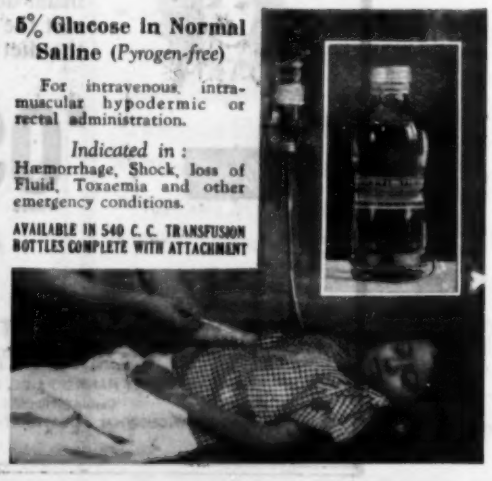

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